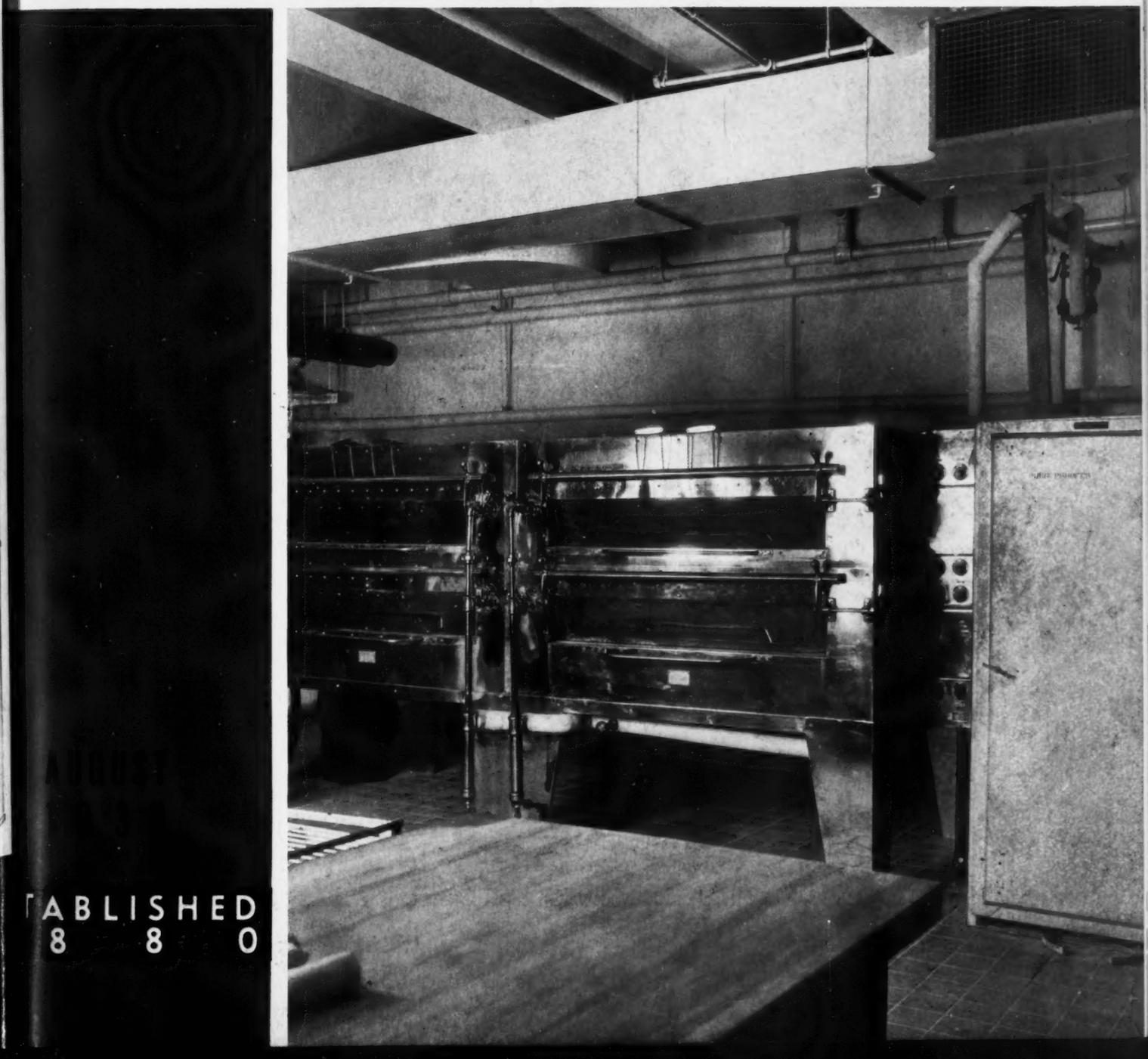
# AMERICAN ARTISAN

RESIDENTIAL AIR CONDITIONING
WARM AIR HEATING • SHEET METAL CONTRACTING



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# LAMNECK SERIES 700 SYSTEM
# PREFABRICATED DUCT AND FITTINGS

## PREDOMINANT QUALITY — AND LOOKS THE PART

• LAMNECK Series 700 System of Prefabricated Duct and Fittings is as predominant in sheer quality as it is advanced in efficiency, flexibility and economy.

Sound engineering, ingenious design, skilled workmanship and high grade materials all contribute their part to the making of a really good looking installation which enhances the appearance of the finest unit. Better styled, better fitting, more modern and graceful in design, Series 700 sets a new standard of dignity in Prefabricated Duct and Fittings which will reflect credit on the dealer installing it and give greater satisfaction to the customer.

### A Better Looking Installation to meet Present Day Standards of Attractiveness

The basement today like any other part of the house must contribute its share of decorative charm and beauty to the home. For this reason the trim neatness and balance of Series 700 with its graceful connections makes a strong appeal to the consumer with good taste. In the modern attractive basement or recreation room Series 700 shows to splendid advantage and helps to promote further sales for you.

*Write for Name of Your Nearest Distributor.*

**LAMNECK PRODUCTS, INC.**

**414 DUBLIN AVENUE • COLUMBUS, OHIO**

PREFABRICATED DUCT AND FITTINGS FOR ALL TYPES OF RESIDENTIAL WARM AIR HEATING AND AIR CONDITIONING SYSTEMS

# How Furblo HELPS YOU SELL AT A PROFIT

AIR CONDITION YOUR HOME for little as
and Furblo gives you SUMMER COMFORT
Add Furblo to your present Furnace and enjoy the Comforts of Modern Air Heating and AIR CONDITION
Furblo QUICK ESTIMATING BASIS
Through Blazing July Days and Sweltering August Nights Furblo GIVES YOU COMFORT
Furblo
SERIES 5000
Is the ONLY blower for Air Conditioning which protects you by a 5-YEAR GUARANTY
Furblo
VEST POCKET DAT.
Furblo for Comfort-Health-Economy
IN WINTER
IN SUMMER
COSTS VERY LITTLE

You make more sales—and more profitable sales—when you support your selling talk with impressive facts which prove to your prospective customer that, with FURBLO, you can give him heating satisfaction—year-round comfort—cleanliness—health—thrifty fuel economy.

FURBLO supplies you with just such brief, convincing sales messages which "turn prospects into profits."

You also get the effective help of reliable, quick estimating methods presented in the authoritative FURBLO Engineering Bulletins — reliable short-cuts that enable you to sell a half dozen conversion jobs for "ordinary" houses in the time that it would take you to figure even one such job by complicated methods.

As a FURBLO user, you can also avail yourself of helpful and dependable engineering advice covering the unusual and troublesome types of jobs.

## HOW YOU CAN MORE THAN DOUBLE REPAIR JOB PROFITS

We help you do this just as we are helping so many other dealers to make bigger profits. Let us tell you how you, too, can double your profits on furnace repair jobs.

**→Mail the Coupon NOW←**

Furblo Co., Hermansville, Mich.

**YES** I want to know how to Build BIGGER PROFITS

Name .....

Address .....

AA Aug. 39 .....

# AMERICAN ARTISAN

WITH WHICH ARE MERGED

FURNACES AND SHEET METALS

AND

Warm-Air Heating

Covering All Activities in Residential Air Conditioning and Small Commercial Cooling, Warm Air Heating, Sheet Metal Contracting and Fabricating

J. D. Wilder, Editor — A. A. Kennedy, Assistant Editor

Vol. 108, No. 8 — August, 1939 — Founded 1880

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## *In This Issue*

THE cover illustration has no direct connection with any article in this issue, but is typical of the activities of today's larger shops. Air conditioning, the fabrication of equipment, metal protection and ornamentation—are all active fields this year.

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We publish on page 36 part two (concluding) of Michigan's proposed state licensing ordinance. Since copies are not available, we suggest that readers interested keep the July and August issues.

•

The contractor whose bookkeeping ideas are described on page 42, has an interesting viewpoint on overhead. He believes that one mechanic does so many dollars worth of work and uses so many dollars worth of material a day, or week, or month and the contractor should strive for sales to match this cost. If he succeeds, profits are sure to follow.

•

This month's Air Conditioning Section is full of cooling. We report two attic ventilating campaigns (pages 47 and 56); S. Konzo concludes his series on cooling with an article on cooling with water in coils (page 58); the importance of register location in cooling (page 54) and structural betterments which reduce cooling costs (page 61) are brought down to cases in the description of a large residence heated and cooled with a system designed according to the new Technical Code (see page 50).

•

The Sheet Metal Section contains a variety of articles. Part 2 of the welding article gives some practical ideas on jigs and shop procedure (see page 70). The steel grit collecting installation on page 68 may contain the basic idea for other similar problems. Wm. Neubecker's pattern for a bay window on page 78 will be followed by part 2 showing another method of covering the same roof.

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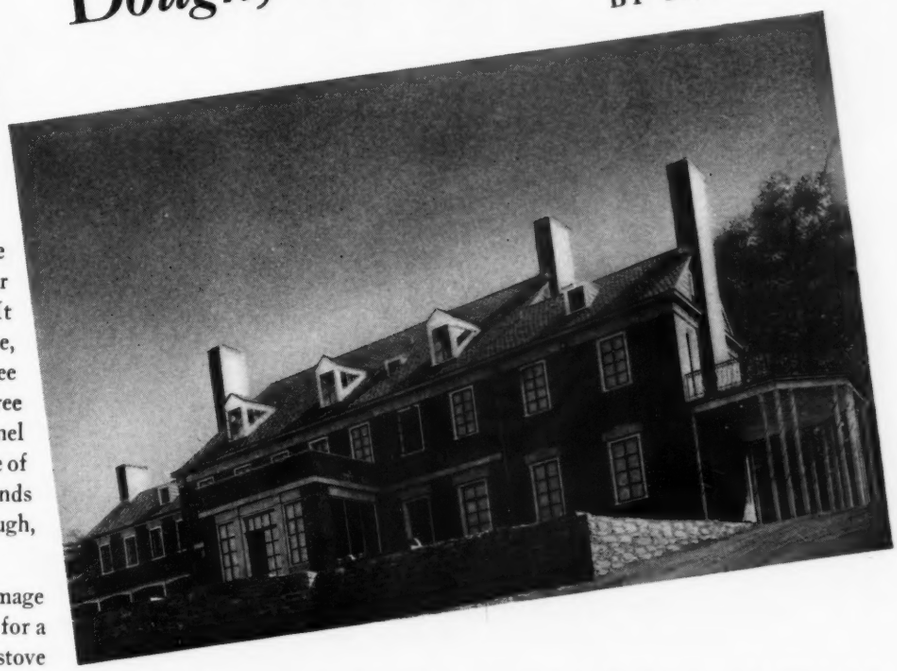
***More than 8,000 Copies of this Issue are being distributed***

# THE GUY THAT MIXED *Dough, Pounds an' Ounces*

BY TIM SHEARS



WORD got around the office the other day about a contractor that landed a nice little order. It was a roofing job on a private house, and it called for Monel... not three or four hundred *pounds,* but three *tons.* That's quite a pile of Monel for a job like that. And quite a pile of dough for the contractor. Reminds me of the guy that mixed the dough, an' also his pounds an' ounces.

Seems his wife went out to a rummage sale an' left him to mix the dough for a batch of bread. "Just set it by the stove to rise," she says, "I'll make it up into loaves tonight." So the old man gets flour an' yeast an' what-not an' there's where he pulls a boner. Instead of using three ounces of yeast to ten pounds of flour, he mixes three ounces of flour with ten pounds of yeast.

Late that afternoon the old lady gets back an' finds the old man out in the yard. "Did the dough rise yet, Pop?" she asks. "Did it rise," he says, "Take a look at that back door. The dingblasted dough's rose so much I can't get back in the house!"

Getting back to that roofing job, it's a thirty room house with a big sun room that has a shaped, pitched roof. They cover this with 0.021 inch Monel sheet, using standing seam construction. Flashings are all Monel, same gauge sheet. Four bay windows also have Monel flashing, as well as seven dormers on the roof an' valleys, chimneys, windows, an' etcet'ra.

The way they handle the Monel gutters ought to interest you sheet metal men. Some of these gutters are 96 ft. long, an' others up to 250 ft. The contractor makes them up in his shop in 8 ft. lengths, ready to assemble. For fitting shorter sections an' making special formations he sets up a hand brake right on the job.

Two other places where Monel was used on this job were the 3½ inch by 4 inch leaders, and ten ventilating louvres. An' here's a good tip this contractor gave me: For soldering the Monel joints he found that a zinc chloride base flux, a bit more acid than used for copper, worked O.K.

If you keep a weather eye open you'll find large buildings aren't the only ones that need Monel roofs. Small public buildings, stores, gasoline stations an' the like are mighty good bets for Monel roofing, gutters, flashing an' so forth. Also small municipal an' county buildings are worth going after.

So remember the City Hall an' the corner gas station are both good prospects for Monel roofs. An' whether you install Monel by the *pound* or the *ton*... there's money in it.

TIM SHEARS.

• • •


THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street New York, N. Y.

"Monel" is a registered trade-mark of The International Nickel Company, Inc., which is applied to a nickel alloy containing approximately two-thirds nickel and one-third copper.

# "I Have Just the Thing for You in a MONCRIEF"

HOW the calls vary; and how easy it is for you, a Moncrief dealer, to fill them all. One prospect demands the ultra in winter air conditioning. Another wants the most for his money in a warm air furnace. Still another inquires about a blower-filter unit for his present furnace. Every inquiry is a profit opportunity when you sell the Moncrief line, modern, complete, bristling with selling points.

To help you finance jobs, you have the Moncrief Finance Plan, liberal and simple.

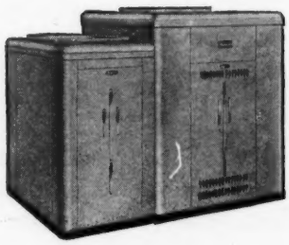
To help you figure, Moncrief Engineering Department is at your service.

To help you sell, there is a complete line of sales and advertising material. There's both profit and all round satisfaction when you sell the complete Moncrief line. Write for particulars.

**The Henry Furnace & Foundry Co.**
**3473 E. 49th St. Cleveland, Ohio**

"Aristocrat"
Oil-Fired Winter Air Conditioner

Steel heating element especially designed for oil-burning: Moncrief Wind Box and many other superior features.



Moncrief "Long Life"

With the 20-year Guarantee. Gives greater satisfaction to the homeowner and profit to you.

**MONCRIEF FURNACES**
**Cast or Steel**
**WINTER AIR CONDITIONERS—Gas, Coal or Oil**
**"MONCRIEF SUPPLIES EVERYTHING USED ON AN AIR CONDITIONING JOB"**

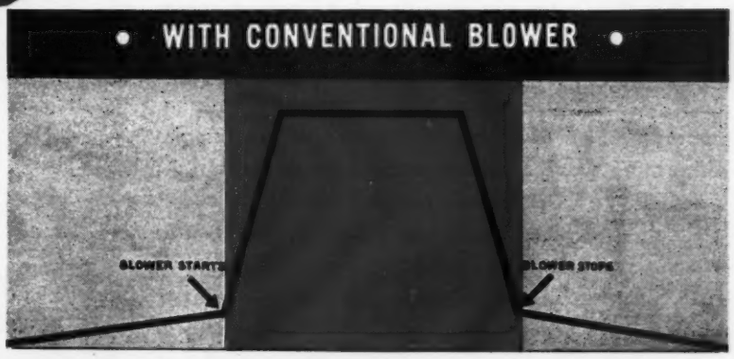
# *You can profit from the advantages of* **VIKING**

## HIGH LOW *Automatic* SPEED CONTROL

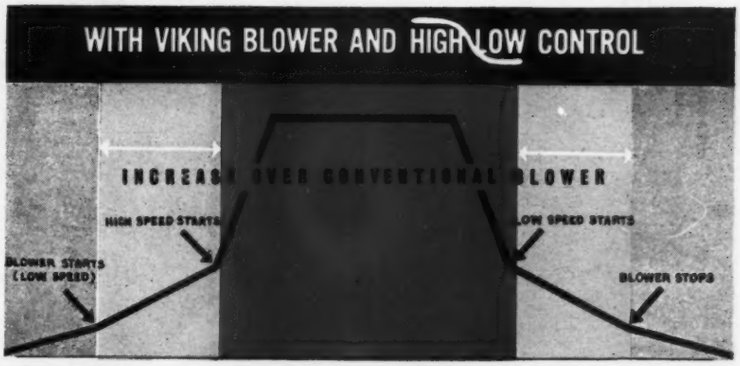
Obviously, if you can offer a better heating and air-conditioning service than your competitors, you will get most of the business. The VIKING Conditioner with HIGH LOW Control, plus many other exclusive VIKING features, gives you definite advantages. Chart below shows graphically one of them.

### *Why* VIKING HIGH LOW CONTROL *gives greater heating satisfaction*

- Starts heat circulation sooner, and nearly doubles air-circulating period.
- Makes available (with 3-speed drive) 6 blower speeds, two of which are controlled automatically. (Automatic controls shown in insert above).
- Prevents "cycling", and heightens furnace efficiency by utilizing all available heat.
- Increases economy of blower operation and reduces fuel cost.
- Banishes "Cold 70", and eliminates air-stagnation and stratification.
- Gives quicker, more even heat, and eliminates "over-run". Increases home comfort.
- Adapts blower for summer air-circulation and practical home cooling.




Normal heating cycle without (above) and with (below) VIKING High Low Control. Shaded pink area shows increase in circulation time gained.



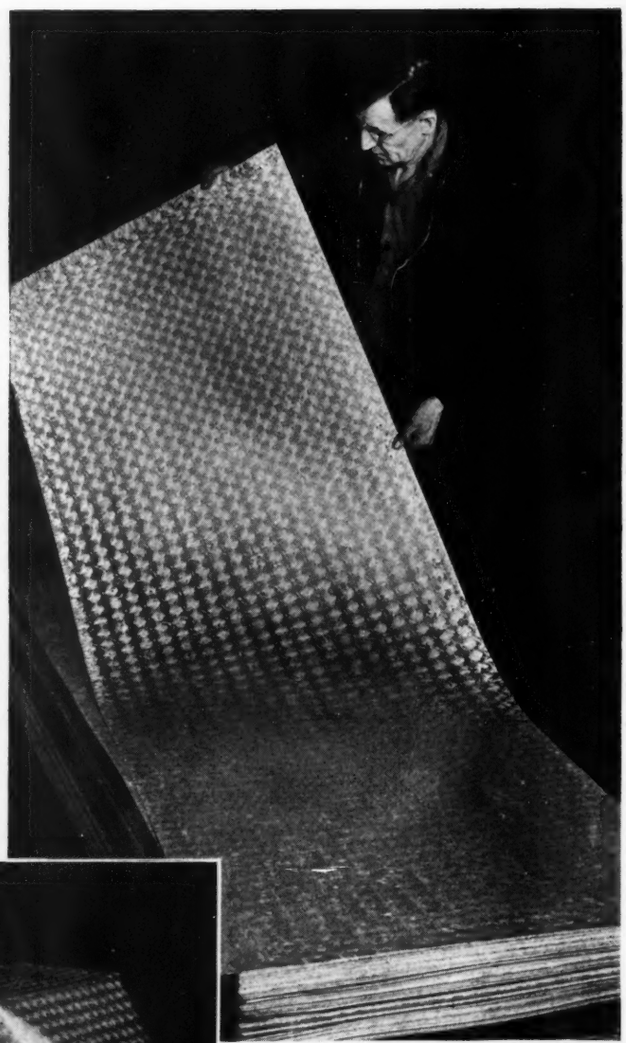
Write today for complete details, including VIKING'S advertising plan for greater dealer sales and profits.

**VIKING AIR CONDITIONING CORPORATION**
Main & Center Streets • Cleveland, Ohio

**VIKING AIR CONDITIONING CORPORATION**

# This Sheet

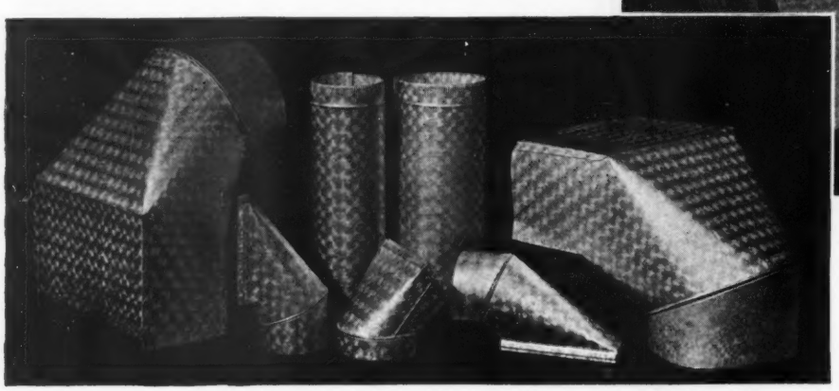
## WILL PUT YOU ON YOUR METTLE



The old saying—"a man is known by the company he keeps"—applies equally well to the tools and materials he works with. If you doubt this, try to think of one shop doing quality work where just any kind of equipment and metal "get by".

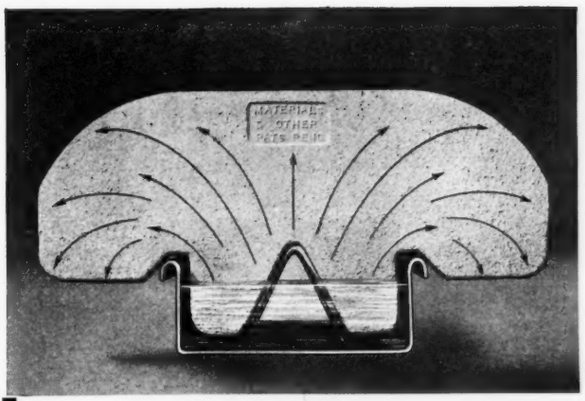
OSBORN'S Golden Star Brand galvanized sheets are helping thousands of plants to do better work because they are better-made to our own rigid specifications. At first glance, you will admire the distinctive appearance of their bright checker-board spangle. Even more, you'll admire how that spangle holds tight when the sheet is double-seamed; how these sheets make-up more easily because they are more uniform in temper, in flatness and in size.

Golden Star Sheets are stocked in a complete range of sizes and gauges at all three OSBORN warehouses. Why not try a few bundles and prove for yourself that these better sheets really help put your entire shop on its mettle?



THE J. M. & L. A.
OSBORN Co
Manufacturers—Distributors
BUFFALO · CLEVELAND · DETROIT
*Metals and Metal Products*

A DEPENDABLE SOURCE OF SUPPLY FOR 80 YEARS



**SECTION OF PAN SHOWING MONITE VAPOR DIFFUSING PLATES IN POSITION**

Question No. 1. Will Monite plates produce condensation in warm air ducts? Ans. No.

Question No. 2. Will Monite plates produce an odor? Ans. No.

Question No. 3. Will Monite plates cause lime dust to accumulate within the furnace casing, warm air ducts, or cause it to be circulated in the air in the home? Ans. No.

Question No. 4. Is it necessary to replace Monite plates when their inner pores finally become lime clogged? Ans. No. Monite plates can be reconditioned very easily whenever necessary.

Question No. 5. How do Monite plates compare with ordinary pan evaporators in capacity? Ans. Each Monite plate is the equivalent of 50 square inches of water surface. The increase for the pan shown is 1250 percent.

Question No. 6. Are all Monite plates uniform in evaporating capacity? Ans. Yes. Monite plates are moulded individually, insuring accurate control of porosity and vapor diffusion.

Question No. 7. What results can be expected from using the recommended number of Monite plates? Ans. Adequate indoor humidity even during the milder winter weather when bonnet temperatures are low and blower operating periods are very infrequent.

# WE WANT YOU TO KNOW THE FACTS!

★ Thousands of questions pertaining to air conditioning are being asked every day and members of the industry who are equipped with sufficient knowledge to intelligently answer the majority of these questions will certainly have the jump on the rest. Knowledge instills confidence in the mind of the buying public and in turn leads to increased sales.

In order that you may have a factual knowledge of Automatic June humidifying systems we have compiled a list of the most common questions asked concerning our products with brief answers to each one. This issue is devoted to our super porous "Monite" vapor diffusing plates.

For a more detailed answer to any one of these questions, write for our technical folder "The Monmouth Vapor Diffuser."

## MONMOUTH PRODUCTS CO.

General Offices and Factory
1933 E. 61st St.
CLEVELAND, OHIO

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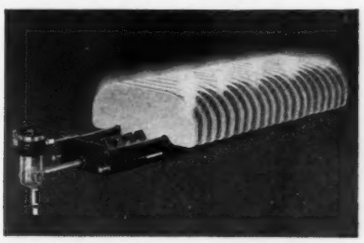


AUTOMATIC JUNE

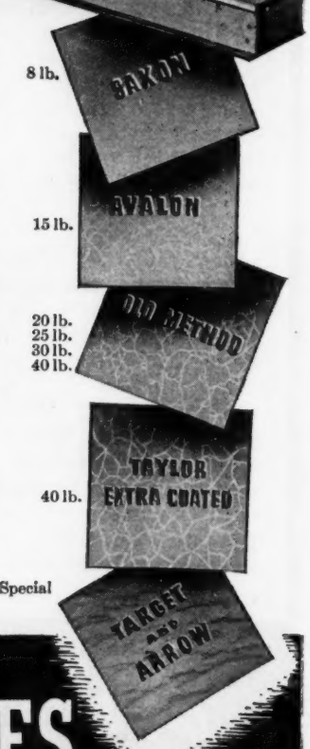
GRADUATED HUMIDITY CONTROL

TODAY · · · AS IN 1810
the Best in Roofing Quality
TAYLOR
ROOFING TERNES
TARGET AND ARROW · TAYLOR EXTRA COATED · OLD METHOD · AVALON · SAXON
TO HELP YOU SELL
more
ROOFING JOBS
TAYLOR TERNES

● To tell the Roofing Contractors of America about the qualities of Taylor Roofing Ternes is "carrying coal to Newcastle," because for 129 years these tin-lead alloy coated sheets have built a reputation through their long life in roofing service.

But the world changes with the passing years. Your prospects today may not have the old pioneer knowledge of the economy of a good "tin roof." To help you tell them about Taylor Roofing Ternes, two envelope enclosures—a folder and a blotter—both with space for imprinting the contractor's name—are available for your use.

These enclosures will help you sell more roofing jobs. Enclose them with your letters, quotations, bills and statements. Ask us to send you sample copies—then decide whether they will be helpful to you and how many you can put to work. They ask no wages.




**REPUBLIC STEEL CORPORATION**

GENERAL OFFICES: CLEVELAND, OHIO

BERGER MANUFACTURING DIVISION • TRUSCON STEEL COMPANY • UNION DRAWN STEEL DIVISION
STEEL AND TUBES, INC. • NILES STEEL PRODUCTS DIVISION

REG. U.S. PAT. OFF.
REPUBLIC
STEEL

# TAYLOR ROOFING TERNES

# ONE WORD TO REMEMBER
## when you want a Fan System Heat Exchange Surface that . . . HAS EVERYTHING

# AEROFIN
## Heat Exchange Surface

**Aerofin Fan System Heat-Exchange Surface covers the entire field of heating and cooling. It embodies the most advanced features in construction and operation. It is more widely used than any other surface on the market.**

**Aerofin was the pioneer of all light-weight standardized surface and remains the outstanding leader in the field today.**

**It is the development of sixteen years of continuous research by a group of specialists whose sole job has been to make better and still better equipment adapted to the practical requirements of consulting engineers, architects and contractors.**

**In Aerofin you'll find everything that you have always wanted in forced air heating and cooling surface, plus an engineering consultative service which assists you in applying it to your individual problem.**

***Request your copy of the Descriptive Bulletin describing this newest Aerofin development.***

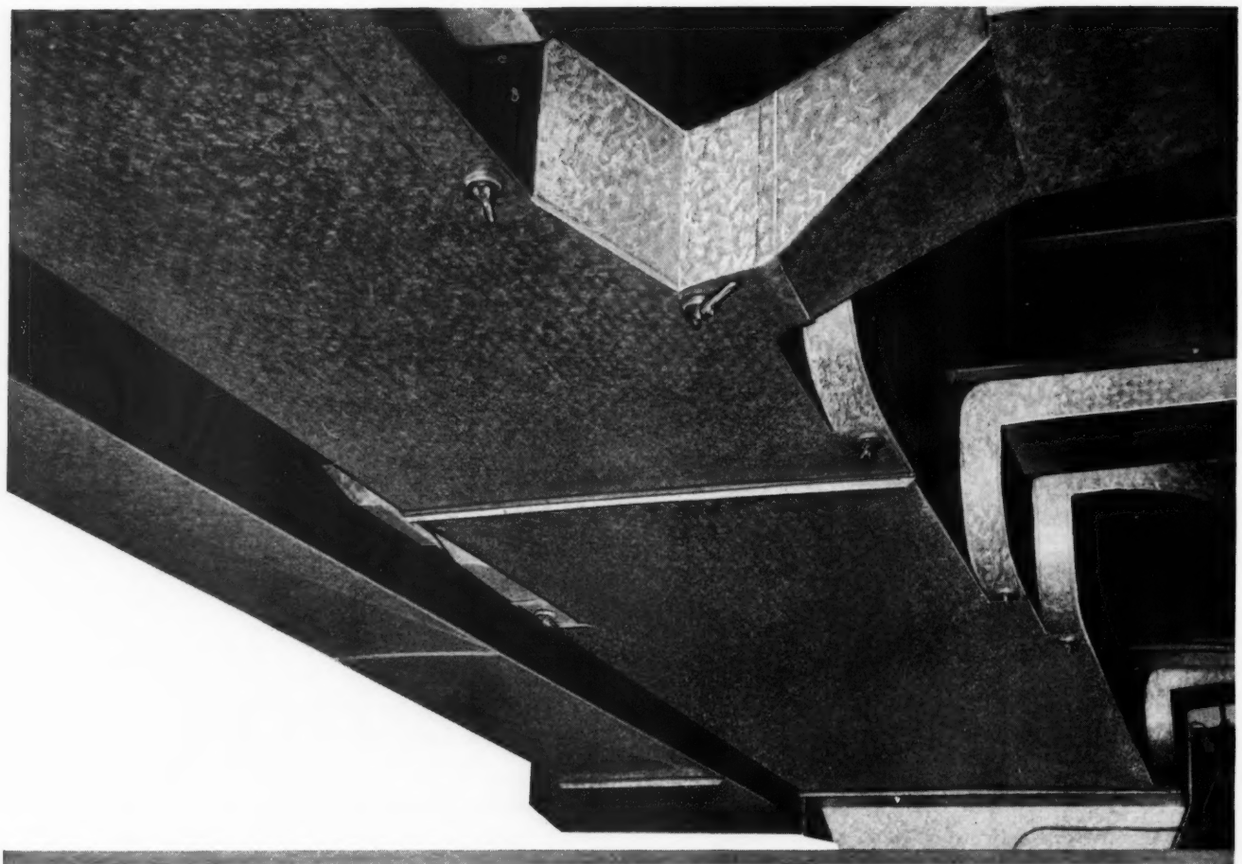
**AEROFIN CORPORATION**
**410 So. Geddes St.**
**Syracuse, N. Y.**

**Please send at once your new illustrated bulletin describing Aerofin Non-Freeze Coils.**

**Name**_____

**Firm**_____

**Address**_____



# Get *Double Protection* with

## Granite City Copper Bearing Soft-Forming Galvanized Sheets

**Heavy spelter and rust-resistant copper add years of extra life—it's true economy**

Here's a bargain for you and your customers! Granite City Copper Bearing Sheets cost so little extra that you can afford to use them for almost every job. More of your customers will want this added protection . . . and now you can give it to them at a cost far below its real value.

Granite City Copper Bearing Galvanized Sheets are uniformly flat and easy to form without flaking or fluting. Laboratory tests and special control throughout their manufacturing process insure an even coating of spelter which tightly adheres to the base metal. Customers everywhere appreciate the difference in Granite City Copper Bearing Galvanized Sheets in their neat appearance and added years of service.

Specify Granite City Copper Bearing Soft-Forming Galvanized Sheets on your next job. (Also available in standard grades). For more information, write:

**GRANITE CITY STEEL COMPANY**

GRANITE CITY ILLINOIS

SINCE GRANITE CITY SHEETS 1878

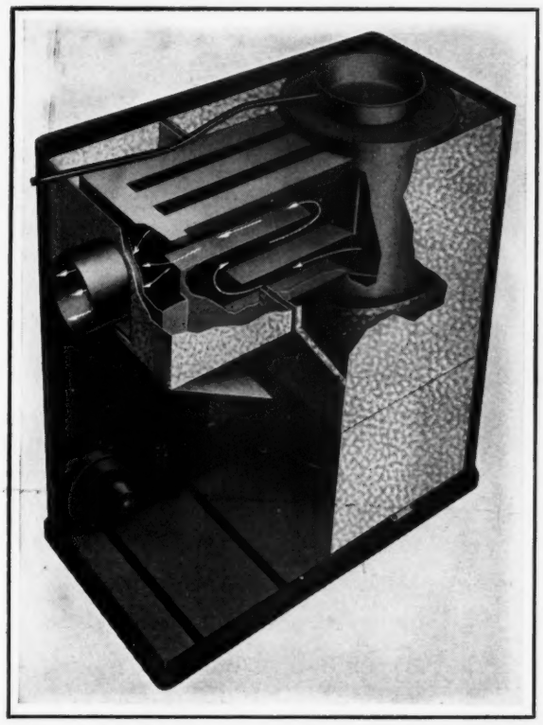
1803 Boatmen's Bank Bldg., St. Louis • 8 So. Michigan Blvd., Chicago
1104 R. A. Long Bldg., Kansas City • 1602 Mariner Tower, Milwaukee
1613 Pioneer Building, St. Paul • 4000 York Street, Denver
77 McCall Place, Memphis • 435 Fifth Avenue Bldg., Moline, Illinois

# WE'RE NOT KIDDING OURSELVES, MR. DEALER

## —Nor Trying to Kid You

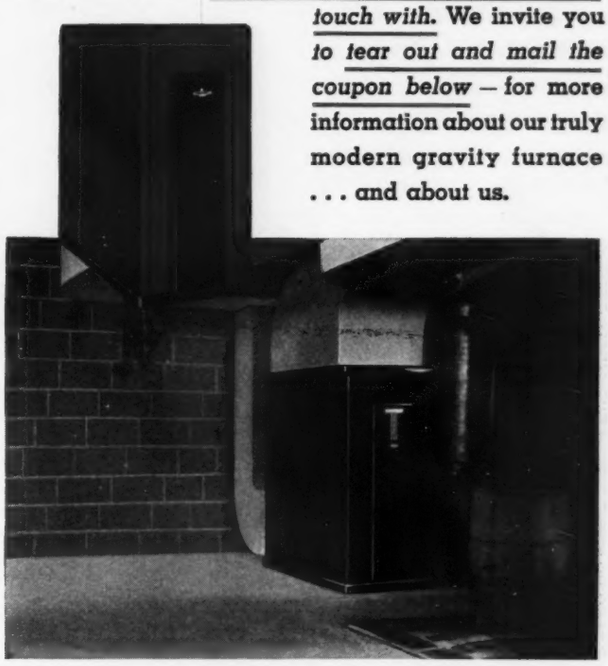
● We make complete oil and gas warm air-conditioning furnaces. Good ones! And we expect to continue selling a lot of them in their proper market. *But we know, as you do, that a very large market exists today for GRAVITY furnaces.*

For that market, we have an oil burning gravity furnace—a *really modern* gravity furnace. It puts out a lot of heat, yet it takes up little more space than a good cookstove!



It comes in a complete package-unit with everything built in. Anyone in the heating business can install it quickly without assembly or adjustment troubles, either in a new home or for replacement. Included in its equipment is the famous Superfex mechanical draft oil burner with all controls and other features, which make our compact furnace quiet, very efficient and economical to operate. The price is attractive.

If you are interested in a man-to-man talk about a dealership; then *you are the man we want to get in touch with.* We invite you *to tear out and mail the coupon below* — for more information about our truly modern gravity furnace . . . and about us.



*An ULTRA-MODERN gravity installation. Note successful use of square ducts.*

# SUPERFEX

*The Mark of Quality*

Oil Burning Gravity Furnaces • Oil Burning Air-Conditioning Furnaces • Cast Iron Gas Air-Conditioning Furnaces • Steel Gas Air-Conditioning Furnaces

PERFECTION STOVE COMPANY • 7177 Platt Avenue, Cleveland, Ohio

Please send more information about your Superfex Oil Burning Modern Gravity Furnace

Name_____

Street Address _____

City and State _____

**JIM:** Tell that to the marines, Half Pint. I'm not robbing myself. Not me!

**LITTLE GUY:** Yes you are! You're tossing away at least a buck's worth of profit on customer after customer.

**JIM:** I don't believe it, but go on.

**LITTLE GUY:** Almost every home owner in this town who has a forced warm-air furnace uses Fiberglas Dust-Stop filters. These filters need to be replaced every year. And the average replacement nets you $1.00 or more.

**JIM:** That would be swell except that nobody knows they need to replace the things.

**LITTLE GUY:** They will, beginning August 12. On that day the Dust-Stop people start a whale of an advertising campaign. It shows the necessity of changing filters and stresses the advantages of filtered warm-air heat.

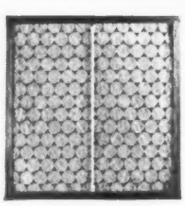
**JIM:** Where does all this advertising run?

**LITTLE GUY:** In the magazines that *mean something* in our business—American Home, Better Homes and Gardens, Saturday Evening Post, and Life. These magazines are read by 38,500,000 people, a good many of them right here in your own town.

**JIM:** Sounds great, but what do I do about it?

**LITTLE GUY:** If you're wise, you'll phone everyone in this vicinity who owns a forced warm-air furnace. You'll send out the free postcards we have for you. And hurry, or some other furnace dealer will beat you to it!

**JIM:** He'll have to hustle. I'm off to the telephone now. A dollar or more per customer sounds good to me!



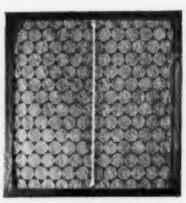
*You can make a lot of extra money this year on*

## FIBERGLAS* DUSTOP* AIR FILTERS

*T. M. REG. U. S. PAT. OFF.

*Manufactured by Owens-Corning Fiberglas Corporation, Toledo, Ohio*

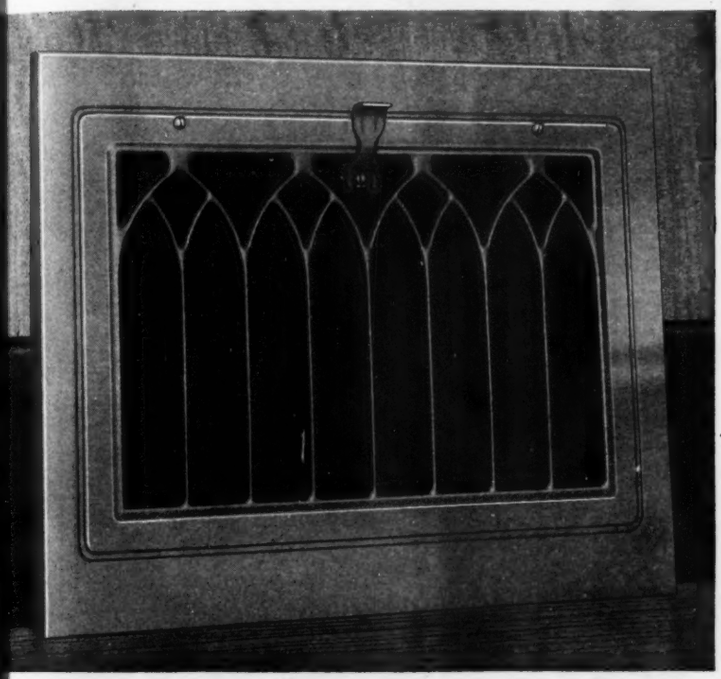
**See Fiberglas at the Fairs—New York and San Francisco**



# Sales Impelling

# H&C QUALITY

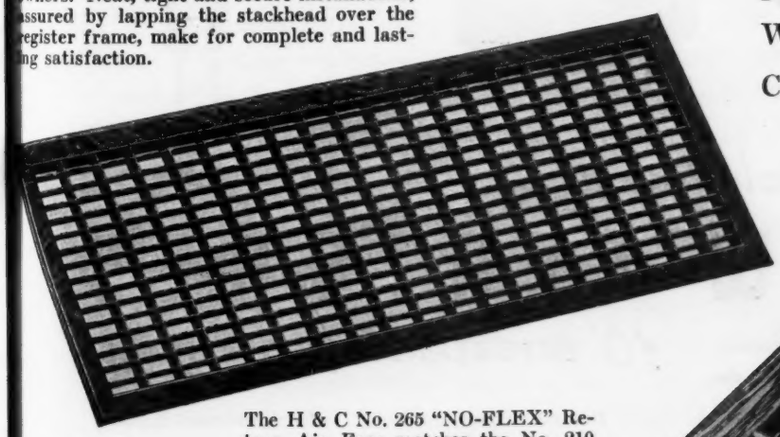
# Costs you Nothing Extra



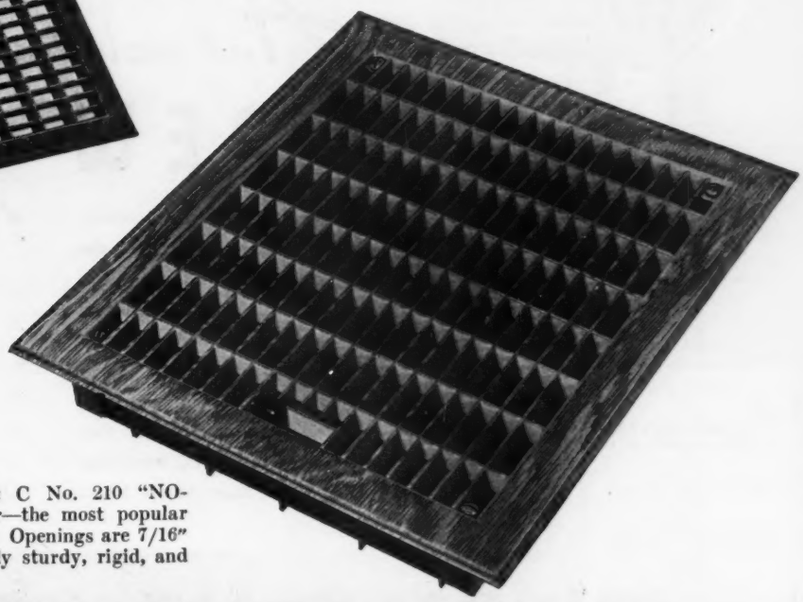
The classic design of the H & C No. 120 Baseboard Register and its dignified air of refinement, are greatly appreciated by home owners. Neat, tight and secure installations, assured by lapping the stackhead over the register frame, make for complete and lasting satisfaction.

Better design and finish, careful, skilled workmanship and sound construction in every detail, plus full-protection packaging—these are all extras that you get as a bonus in H & C Registers, for they cost not one cent more than ordinary registers.

Standardize on H & C and let these extras go to work for you. They help considerably in converting prospects into sales. See the H & C line at your Jobbers. Write for copies of No. 37 Gravity and 39 A.C. Air Conditioning Catalogs, if you do not have them.



The H & C No. 265 "NO-FLEX" Return Air Face matches the No. 210 Floor Register. Cross members are welded to each other and to the frame for maximum strength. Upper edges of members are squared for improved appearance. Corner joints are invisible. Margins are narrow for close installation.



At right is the H & C No. 210 "NO-FLEX" Floor Register—the most popular floor register ever built. Openings are 7/16" x 1-7/16". Exceptionally sturdy, rigid, and heel-proof.

**HART & COOLEY MANUFACTURING CO**

Warm Air Registers • Air Conditioning Grilles • Damper Regulator Sets • Dampers • Chain • Pulle

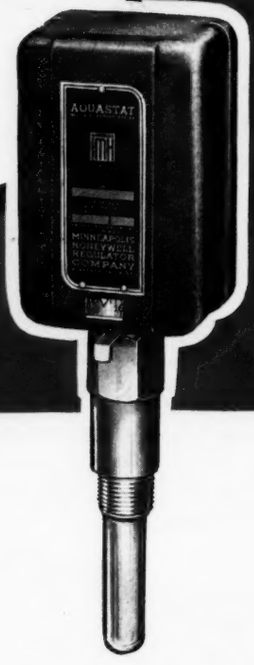
**FACTORY AND ENGINEERING SALES OFFICE:**

**HOLLAND (H&C) MICHIGAN**

Chicago Office: 61 W. Kinzie St. Philadelphia Office: 1600 Arch St.

# A New IMPROVED LINE OF LIMIT CONTROLS

## SUPERIOR QUALITY - SMALLER SIZE MATCHED DESIGN




*And including many*

# NEW FEATURES

YOU have asked for these new features in limit controls. And here they are! Styled by America's foremost designer, Henry Dreyfus, these new matched units are smaller, simpler, and more compact. Their attractive dignified design is styled to harmonize with the modern heating equipment with which they will be used. Watch for the M-H engineer with this new line of limit controls. Then check their superior qualities and improvements. Minneapolis-Honeywell Regulator Co., 2726 Fourth Avenue South, Minneapolis, Minn.

## 10 IMPORTANT IMPROVEMENTS

1 · Distinctive Appearance
2 · Matched Units
3 · Small and Compact
4 · Simple Adjustment
5 · Visible Scales
6 · Enclosed Bellows
7 · Protected Helix
8 · Now mountings
9 · Greater precision
10 · Longer life

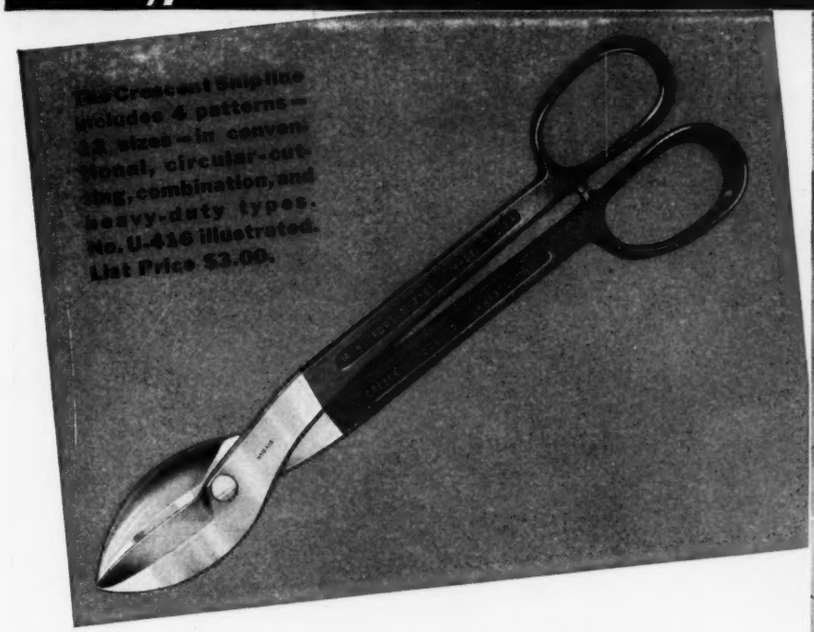
**Dependable Controls Cost Less Than Service**

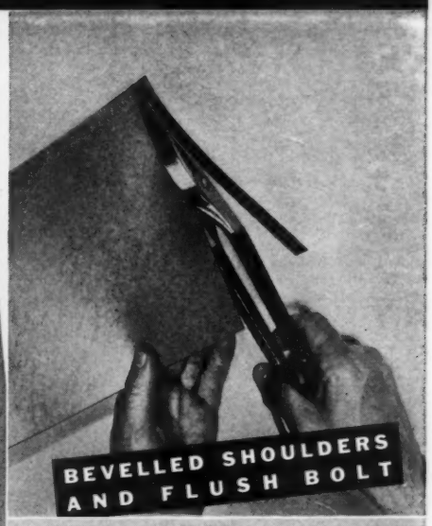
*Since 1885*
**Partners**
in
Public Acceptance
•
AUTOMATIC HEATING
and

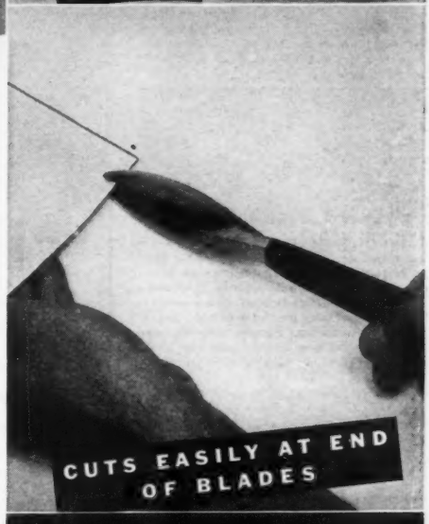
# MINNEAPOLIS-HONEYWELL

*Control Systems*

# *Why* CRESCENT SNIPS ARE SUPERIOR!


The Crescent Snip line includes 4 patterns—22 sizes—in conventional, circular-cutting, combination, and heavy-duty types. No. U-416 illustrated. List Price $3.00.



**Crescent Snips are designed primarily to provide maximum *cutting ability*. But well as that quality has been provided, their design is such that other valuable features that make for greater utility and convenience, have been included rather than sacrificed.**

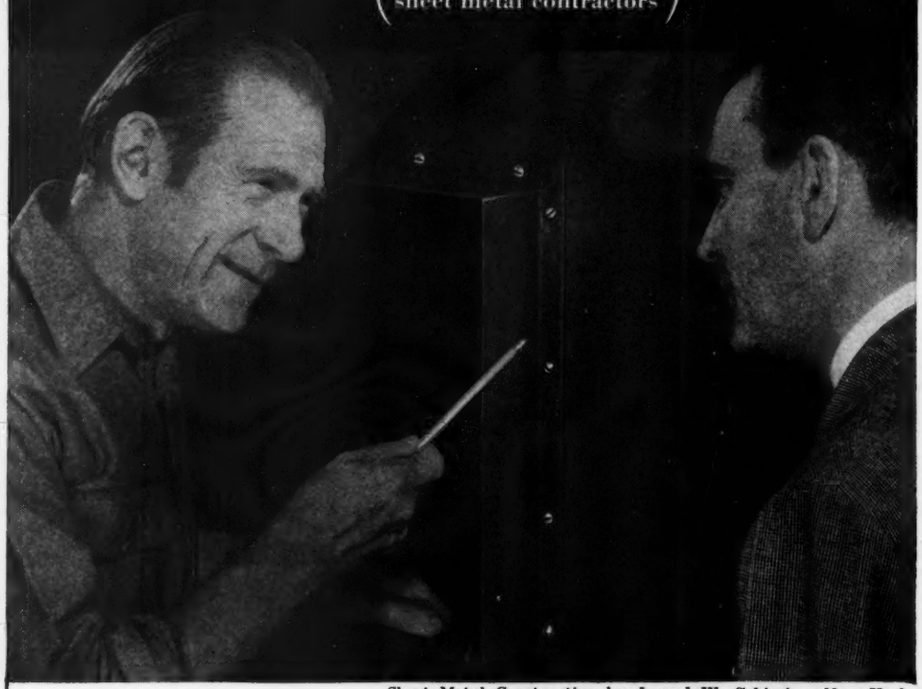
**For example, when a Crescent Snip cuts through stiff, awkward metal you will find it sliding smoothly over the gently-bevelled shoulders. The Bolt is flush too — always out of the way. And whether you are cutting well back on the blades or right out at the tips, your Crescent Snip cuts with remarkable ease. All in all, you'll find in Crescent Snips the little things, as well as the big ones, that make a mechanic a happier and better workman when he uses a really fine tool.**

**There is a Crescent pattern for every type of service. Put in a representative stock of these moderately-priced, fast-selling tools. Your jobber can supply you.**

## CRESCENT TOOL CO., JAMESTOWN, N. Y.

# "You bet I use genuine PARKER-KALON *screws* . . . I can't afford to take a chance"

(Say thousands of sheet metal contractors)



Sheet Metal Construction by J. and W. Schiering, New York.

**"IMITATIONS never quite make the grade. I can't risk using such screws that fail to 'deliver the goods' . . . That's why I'm sold 100% on the genuine article — Parker-Kalon. These Sheet Metal Screws are uniformly accurate. They are threaded full diameter to the head. Threads don't strip nor do heads twist off. Parker-Kalon Screws go in smoothly, hold securely every time—so I can count on my jobs being finished on schedule."**

This superior quality didn't just happen. It is the result of experience gained over more than 25 years in developing and manufacturing Sheet Metal Screws . . . of unsurpassed production equipment and processes . . . of laboratory facilities, without counterpart in the industry, for controlling and maintaining the high Parker-Kalon standards.

**PARKER-KALON CORPORATION, 200 VARICK ST., NEW YORK, N. Y.**

***Sold Only Through Recognized Distributors***

## PARKER-KALON *Sheet Metal Screws*

### *4 Reasons Why* YOU CAN DEPEND ON PARKER-KALON PRODUCTS

***Unexcelled Laboratory Facilities*** . . . The Parker-Kalon Laboratory which controls and maintains the high standard of quality for which Parker-Kalon Screws are so widely recognized, represents an investment of over $250,000.

***Specialized Production Equipment*** . . . (including the Parker-Kalon Hardening furnaces illustrated) is required to produce Parker-Kalon Self-tapping Screws and to maintain their uniformly high quality. The Parker-Kalon plant is famed as the most up-to-the-minute plant in the industry, with a capacity of 8,000,000 Screws per day.

***Free Engineering Service*** . . . To assist designers and production men in obtaining better fastenings at lower cost, Parker-Kalon Assembly Engineers are available throughout the country. Their services are free to users of Parker-Kalon Self-tapping Screws as well as to those who wish to investigate the time-and-labor-saving possibilities of these Screws.

***Available Everywhere*** . . . No matter where your plant is located there is a reputable supply house distributing Parker-Kalon Screws . . . assuring you of a dependable source of supply.

# I wouldn't part with my SUNBEAM Manual for $100!

## YEARS OF ENGINEERING LEADERSHIP IN AIR CONDITIONING MADE THIS MANUAL POSSIBLE—*AND IT'S YOURS FREE!*

INTO the pages of the Sunbeam Engineering Manual have gone the experience and knowledge that have contributed to Sunbeam's national leadership.

In a simple, concise way the Manual puts at your fingertips the data you need to design and calculate accurately winter air conditioning for any home.

Mail the coupon today for your free copy of the Sunbeam Engineering Manual.

And remember the Sunbeam line is complete, with units in all price ranges for all fuels—coal, oil or gas.

Sell these products now on FHA terms through our Heating and Plumbing Finance Corp.—No down payment . . . no red tape . . . up to 3 years to pay—*You* get full cash on installation!

AMERICAN RADIATOR & Standard Sanitary CORPORATION

*Visit our exhibits at the New York World's Fair and Golden Gate Exposition*

FOLLOW THE LEADER FOR SALES & PROFITS

SUNBEAM AIR CONDITIONING

AMERICAN RADIATOR & STANDARD SANITARY CORP.
Elyria, Ohio

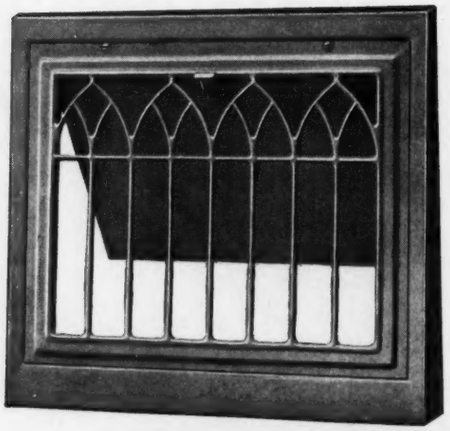
Please send me a free copy of your Sunbeam Engineering Manual, and the name of a nearby Sunbeam jobber.

NAME.....

ADDRESS.....

CITY..... STATE..... AA-8-39

Copyright August 1939, American Radiator and Standard Sanitary Corporation



GOTHIC

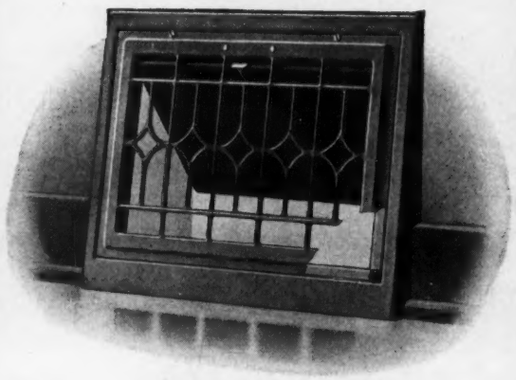
# INDEPENDENT

## BASEBOARD REGISTERS

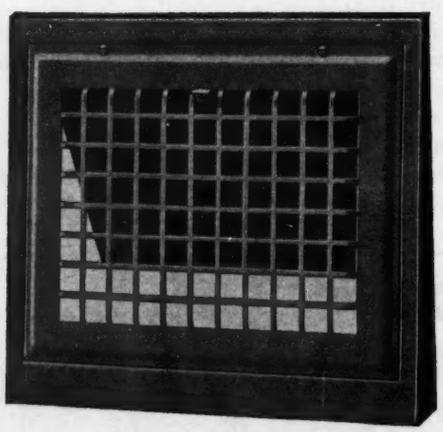
Always leading, always progressing, Independent makes a line of baseboard registers with which you can meet every requirement. They combine the utmost in style, utility and durability. Workmanship and finish are up to the high Independent standard in every particular. The operating mechanism of all designs is permanently adjusted to the proper tension at the time the register is manufactured, an assurance the valve will remain in the desired position. Whatever your need, Independent can supply it.

*Send for catalog*

**The Independent Register Co.**
3747 EAST 93RD STREET, CLEVELAND, OHIO



MOORISH



PLAIN LATTICE

939

# WINTER CONDITIONING OF A 6-ROOM HOUSE NEEDS 26 GALLONS OF WATER EVERY 24 HOURS . . .

## *Can your ducts take it?*

★

The average 6-room house needs about 26 gallons of water every 24 hours to maintain the accepted standard humidity for winter air conditioning. Contrasted with the dry air of the hot air jobs, that's about 350% more water to cause duct corrosion.

Alert sheet metal contractors realize these conditions and meet them with Youngstown Galvanized Sheets. The care used in cleaning the Youngstown base metal plus the care and lack of haste in the galvanizing operation has produced a galvanized sheet with a full generous coating of zinc, and a thorough adherence of the zinc to the base metal. You get only prime sheets, fully coated and strictly up to the Youngstown standard for quality.

Buy Youngstown Galvanized Sheets for your duct jobs. You'll make installations on schedule, and you'll be sure the jobs will stand up in service.

★

GALVANNEALED TRADE MARK YOUNGSTOWN SHEETS

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon and Alloy Steels

General Offices - YOUNGSTOWN, OHIO

Sheets - Plates - Pipe and Tubular Products - Conduit - Tin Plate
Bars - Rods - Wire - Nails - Tie Plates and Spikes 10-8B

# This Big Campaign TO PROMOTE WARM A

MORE THAN **70%** OF THE NEW HOMES BUILT IN 1938 WERE **WARM AIR HEATED**

This sign is your guide to the Warm Air Heating Contractor who will tell you why.

*Now is the time to . . .*
**REPLACE DIRTY FILTERS**
IN YOUR
**WARM AIR HEATING SYSTEM**

This sign is your guide to the Warm Air Heating Contractor who will tell you why.

*Now is the time to install*
**HUMIDIFIERS and CONTROLS**
ON YOUR
**WARM AIR HEATING SYSTEM**

This sign is your guide to the Warm Air Heating Contractor who will tell you why.

*Now is the time to have your*
**WARM AIR FURNACE**
**CLEANED AND REPAIRED**

This sign is your guide to the Warm Air Heating Contractor who will tell you why.

## 15 NEWSPAPER ADS SUCH AS THESE WITH A DAILY CIRCULATION OF APPROXIMATELY 1,500,000

Yes, five different advertisements such as the three illustrated here will be inserted three times a week each, every Monday, Wednesday, and Friday, in newspapers throughout the country that have a total daily circulation of better than 1,500,000 readers. These advertisements all bearing the slogan of "This sign is your guide to the Warm Air Heating Contractor who will tell you Why," will stimulate interest among the warm air users in your territory and definitely identify you as the logical person to consult for this type of work.

## WEEKLY WINDOW POSTERS TO TIE WITH NEWSPAPER ADS SENT YOU FREE

A series of window posters, printed in red and white for utmost attention value, and carrying the same wording as the weekly newspaper ads, will be mailed to you, one each week for five weeks for prominent display in your window. These posters, 20 x 10 inches in size, are legible at quite a distance. Sent to you free of all cost and obligation, all that is asked in return is that you make sure that each one is displayed as conspicuously as possible. Get set for this September campaign to increase business . . . . send your name and address to us at once . . . for dealers displaying these posters will be the ones to cash in on this advertising. . . . Act Now!

## THIS CAMPAIGN IS SPONSORED BY THE FOLLOWING DISTRIBUTORS O

**NORTHWESTERN STOVE REPAIR CO.**
Established 1872
662 WEST ROOSEVELT RD. CHICAGO, ILLINOIS

**PENINSULAR STOVE CO.**
2699 GRATIOT AVE. DETROIT, MICHIGAN

PIPE · FITTINGS · REGISTERS · FURNACES · BLOWERS · FILTER

# AIR HEATING BUSINESS is YOUR Advertising

FOR the first time in the history of the Warm Air Industry. . . . An advertising campaign that all dealers can tie in with, regardless of the make of furnace that they handle. Yes, an advertising campaign designed to stimulate warm air heating business, both for new installations and also repair work on the old. . . . It is an advertising drive that will result in additional jobs and profits for you.

Starting on September 4th the campaign outlined on the opposite page will swing into action. The newspaper ads will suggest Warm Air Heating systems as the best and most desirable . . . will act as forceful reminders on the facts that filters should be replaced, furnaces cleaned and repaired, controls checked and humidifiers added. All in all their object will be to create business for YOU, no matter what make of merchandise you handle.

## Join the Parade... TIE IN WITH THIS TREMENDOUS CAMPAIGN DESIGNED TO PROMOTE YOUR SALES!

You can assure the success of this advertising, and get the most out of it yourself, with just a bit of good old co-operation on your part. Poster blow-ups of the advertisement appearing in the newspapers are available, and will be sent to you upon request free of cost. Get them, and display them prominently in your window. . . .Change them every week. . . .and keep talking Warm Air Heating incessantly. If you are contemplating an ad featuring your company during September, mats featuring the weekly slogan will be sent you free of charge. This is a promotion of your business and you should take advantage of it.

***Send in Your Name and Address at Once and You will Receive the Weekly Posters and Mats without Cost or Obligation***

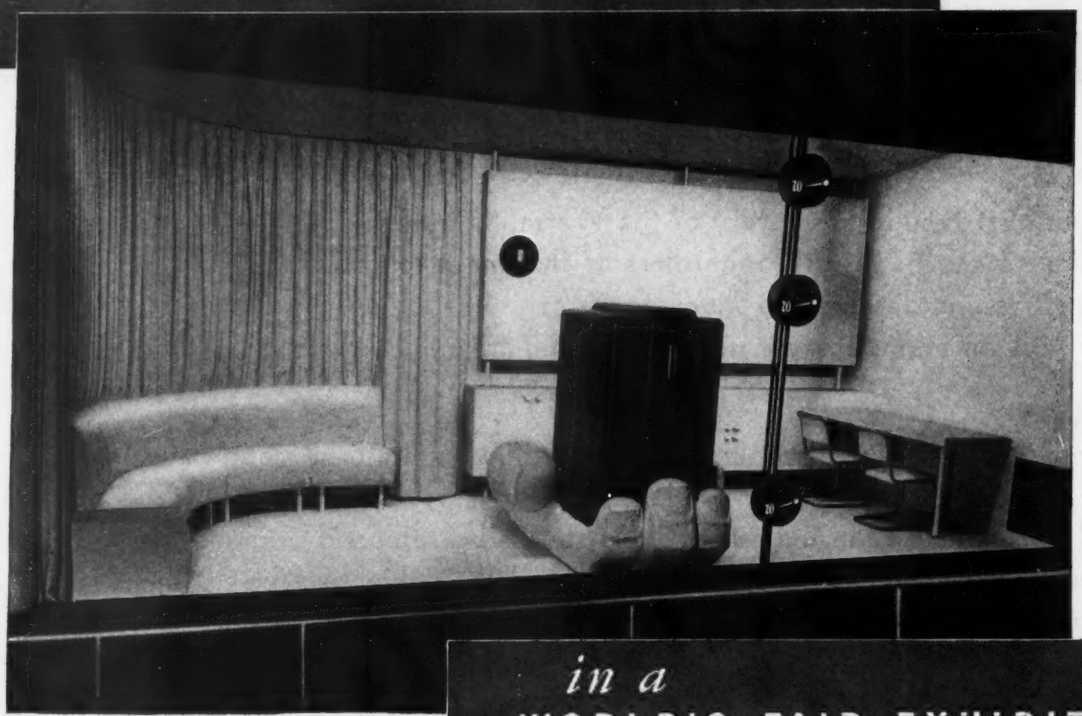
REPAIR PARTS TO FIT ALL MAKES OF FURNACES, BOILERS, and STOVES

**CAPITOL FURNACE & STOVE REPAIR CO.**
**523 E. WASHINGTON ST. INDIANAPOLIS, INDIANA**

**CENTRAL FURNACE & STOVE REPAIR CO.**
**3937 OLIVE ST. ST. LOUIS, MISSOURI**

GAS RANGES · COAL STOVES · HEATING & COOKING EQUIPMENT

# ANTHRACITE *speaks for itself*



*in a*
## WORLD'S FAIR EXHIBIT!

ANTHRACITE speaks for itself in "The White Room," one of the features of the Anthracite World's Fair Exhibit. "The White Room" is both animate and articulate—has action and speaks. Concealed voices tell in a quick and easily understood dialog, why Anthracite provides such healthful heat by the even temperature that avoids "cold seventy." Synchronized lights show, graphically, the points so clearly explained by the unseen voices. Walls, ceiling, furniture and draperies of spotless white tell even better than words, the story of Anthracite's cleanliness.

***Every heating contractor should see this***

Every plumbing and heating contractor should see this whole exhibit . . . See the hand of comfort, the wall of protection, the hall of manufacturers with varied types of Anthracite equipment on display. See it not only because you may learn something new about Anthracite and Anthracite equipment, but also because you are sure to learn something new about the absorbing interest the public has in Anthracite equipment. Thousands of families are learning, through this World's Fair Exhibit, how efficient, how economical, and how convenient Anthracite really is. Hundreds of these families are purchasing new Anthracite equipment—equipment that you must sell and install.

**ANTHRACITE INDUSTRIES, Inc.**
**Chrysler Building New York, N. Y.**

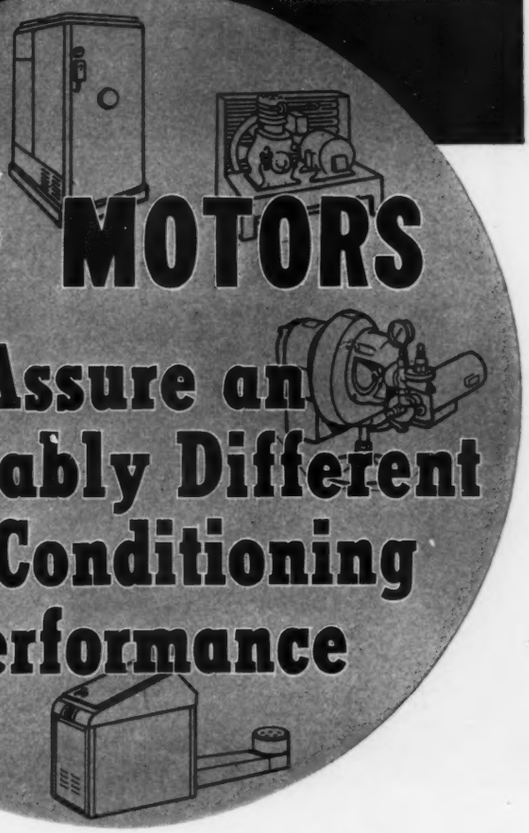
*This Seal of Approval appears on equipment only after a representative sample has satisfactorily passed rigid and impartial tests at the Anthracite Industries, Inc., Laboratories.*

ANTHRACITE INDUSTRIES INCORPORATED — approved

*Save with* Pennsylvania ANTHRACITE
(HARD COAL)
THE ONLY 7 STAR FUEL

*Century Motor Specialization*
*+ Correctly Engineered Application*
*=Satisfaction and Economy*

# WHY Century MOTORS Assure an Agreeably Different Air Conditioning Performance



## Just a Few CENTURY MOTOR Features to Think About

**START QUIETLY** . . . no groans or grunts at starting that can be more disturbing than operating noise.

**RUN QUIETLY** . . . true air conditioning comfort must be quiet comfort.

**FOR HARD TO START LOADS** . . . ability to start and bring the modern compressor up to speed without overmotoring the running load. Also you can use the same size polyphase motor as single phase.

**THERMAL OVERLOAD BUILT-IN PROTECTION** . . . at very low cost. Most fractional sizes available. Listed by Underwriters. Protects against over current and over temperature. Do not fail to investigate this simple, effective, Century built-in automatic overload protection.

**EXTRA PROTECTION FOR DAMP BASEMENTS** . . . Century's new insulation resists moisture, therefore gives added safety assurance in the presence of extreme dampness.

**LONG LIFE CONSTRUCTION** . . . large bearings machined from phosphor bronze castings provide greater safety factor to abnormal belt tension stress. Unique bearing bumpers prevent annoying vibration from V-belt irregularity. Century wool yarn system of lubrication (fractional sizes) lubricates for at least a year of continuous operation without attention.

**LOW STARTING CURRENT** . . . where starting current limitations are a problem, Century type RS Repulsion Start Induction Motors for single phase and type AS Automatic Start for polyphase reduce light flicker and give better results when lines are heavily loaded.

Century MOTORS

NOT THE LEAST important factor contributing to "top" air conditioning performance is the ability to match the correct operating characteristics of the electric motor to the character and surroundings of the driven machine.

Let Century help you apply electric motors under this principle and you will get an "agreeably improved" air conditioning performance, and make more friendly satisfied customers for your equipment.

***Century can back up this promise for these reasons:***

(1) Century specializes in the motor business.

(2) Century motors established their reputation driving blowers —fans—pumps—refrigerator compressors—unit heaters—unit coolers—oil burners—stokers—long before the combination of these units were called air conditioning.

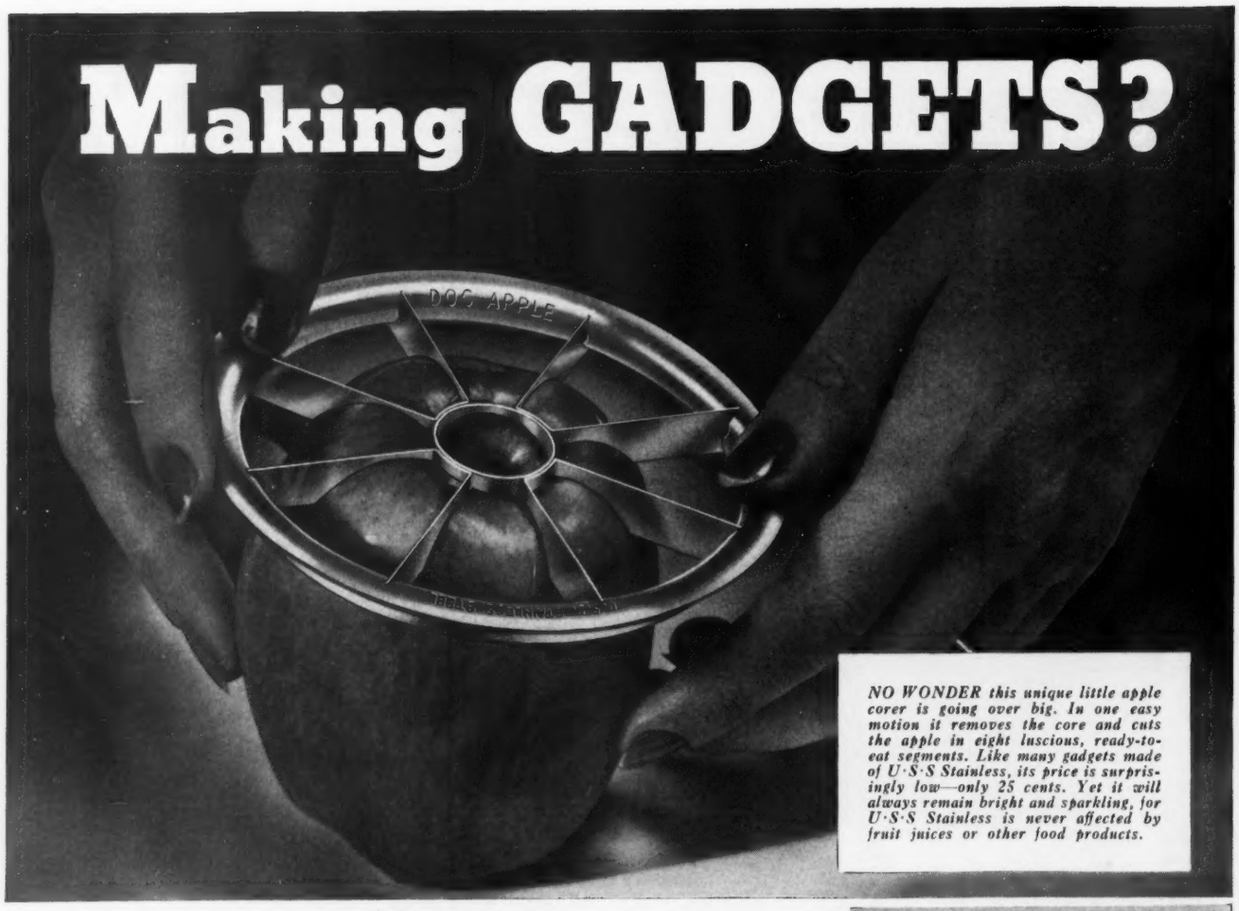
(3) The great variety of types and most complete line allow a flexibility of selection, making it easy to correctly match the application.

The success of your business and your profits depend upon the satisfactory performance of air conditioning equipment you sell, specify or install. For many years Century has studied the problem of correct motor application in the air conditioning field. The extensive experience of Century engineers is always available to you. Get in touch with the nearest Century Motor Specialist today — you'll find his counsel helpful and valuable.

**CENTURY ELECTRIC COMPANY**
1806 PINE STREET ST. LOUIS, MO.
*Offices and Stock Points in Principal Cities*

***One of the Largest Exclusive Motor Manufacturers in the World***

# Making GADGETS?




*NO WONDER this unique little apple corer is going over big. In one easy motion it removes the core and cuts the apple in eight luscious, ready-to-eat segments. Like many gadgets made of U·S·S Stainless, its price is surprisingly low—only 25 cents. Yet it will always remain bright and sparkling, for U·S·S Stainless is never affected by fruit juices or other food products.*

## Make them of U·S·S Stainless . . . and they'll SELL!

LET'S say you have an idea for a new gadget. It might be an apple corer, like the one shown here, or any of a million and one gadgets that can earn a profit for you only if it sells . . . and sells fast.

The question is: How are you going to pack your gadget with sales appeal? How are you going to make it stand up on the counter and shout "Buy me!" to customers?

The answer is easy: Make it out of U·S·S Stainless Steel.

Everybody knows about Stainless, the metal that cleans in a jiffy, and looks new after years of service. And everybody knows and respects those three initials "U·S·S." They stand for the finest in steel products. Put them both together, and you have an unbeatable combination.

Remember: In every case on record, this everlasting metal has helped boost sales. Take advantage of its established popularity by making your gadget of it. Then stamp it plainly "U·S·S Stainless," and watch the orders come in. Write for complete information.

USS STAINLESS STEELS — UNITED STATES STEEL CORPORATION SUBSIDIARIES

**ON ALL STEEL PRODUCTS look for the U·S·S quality symbol. And be sure the mark of U·S·S Stainless appears on metal products that you want to remain bright and rust-free. It's your guarantee of a long-lasting, brilliant, easy-to-clean surface.**

# U·S·S STAINLESS STEEL

AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
NATIONAL TUBE COMPANY, *Pittsburgh*

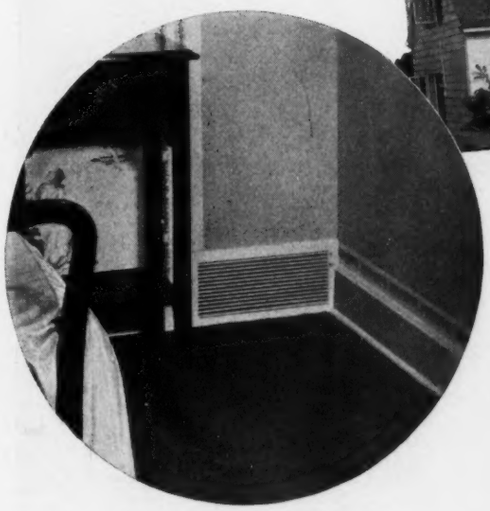
Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Products Company, New York, *Export Distributors*
Scully Steel Products Company, Chicago, *Warehouse Distributors*

# UNITED STATES STEEL

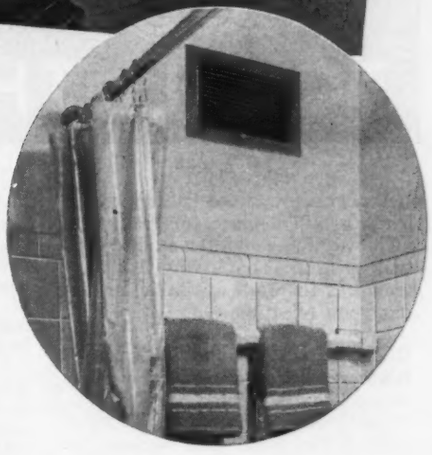
# AUER REGISTERS

Royal Barry Wills, Arch.

Nutt Construction Co., Contractors



## *in Cleveland's*
# "LIFE" HOUSE



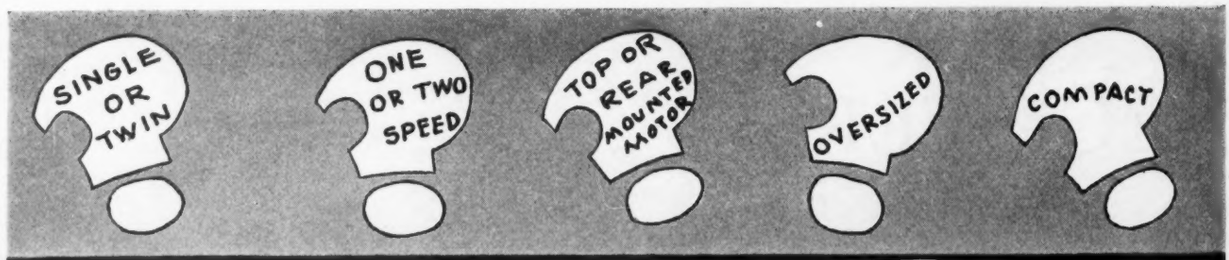
**The first of the nationally featured houses to be built in Greater Cleveland, in the series designed under the sponsorship of "Life" Magazine, is pictured above. It is located in Beechwood, Cleveland suburb. This residence has automatic gas heating and winter air conditioning. In keeping with its fine construction and appointments throughout, the building is equipped with AUER Registers and Intakes—another mark of distinction for the quality of Auer Products.**

**Complete line of registers and intakes for warm air and air conditioning shown in Auer Book No. 39—sent on request.**

THE AUER REGISTER CO., 3608 PAYNE AVE., CLEVELAND, O.

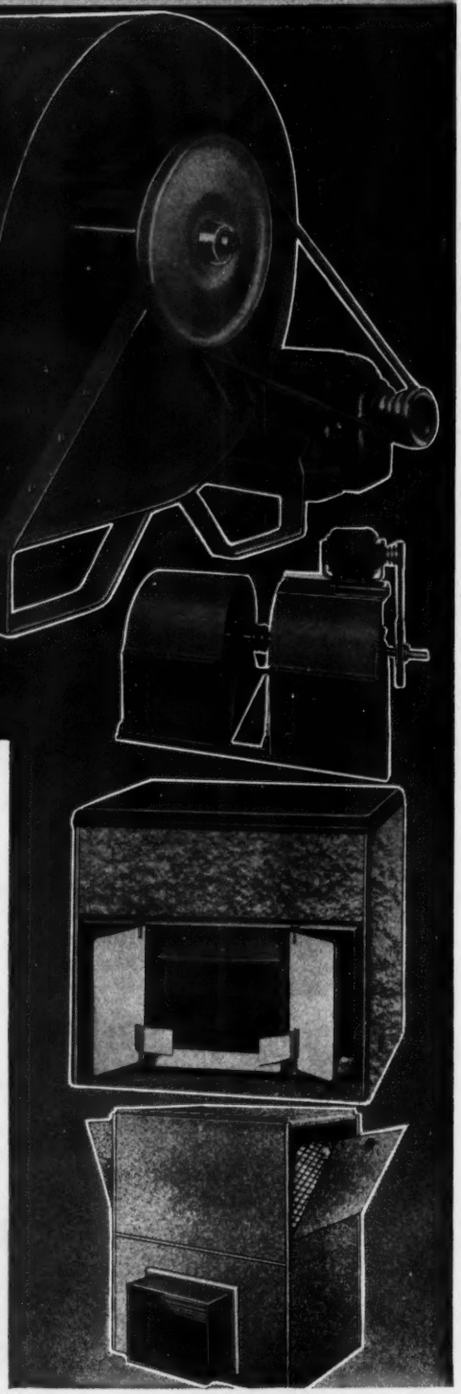
**AUER** DISTINCTIVE **REGISTERS**

**& GRILLES** For Air Conditioning *and* Gravity




# *When You give the Answer . . .*

## WE HAVE A REX AIR-PAK TO FILL THE BILL!



Let arguments rage if they must. There's still a place for each type of blower, blower-filter unit or control system. That's why Air Controls has them all available, awaiting your selection.

**REX AIR-PAKS and REX A. C. Blowers with single-speed control.** Many heating men prefer the single-speed motor and bonnet control for most jobs because of its simplicity, dependability and low cost. We are always ready to furnish our units with a bonnet switch of recognized quality.

**REX AIR-PAKS and Blowers with two-speed control.** For those jobs which require sensitive control and continuous blower operation, there are REX AIR-PAK units complete with two-speed motors and switches at competitive prices.

**Automatic by-pass louvres — the *original* two-speed system.** Over a decade ago our predecessor company realized the desirability of auxiliary air circulation during times when the blower is idle to insure a smooth heating cycle. Automatic louvres were developed to permit ample gravity air flow at *no* operating cost. They are still in great demand—especially for coal-burning furnaces.

**The Patrol Modulator—for balanced air delivery.** This exclusive system keeps air flow volume in balance with heat output of furnace at all times. Realize the goal of all heating control systems—modulated regulation. It can be had with any REX AIR-PAK.

**REX A. C. Blowers.** Furnished in any size from ten to twenty-five inch (600 to 9,000 C.F.M.)—any style—horizontal, vertical or down discharge, top or rear mount—single or twin, with louvres or without—any type—pressure and volume characteristics to fit the needs of any manufacturer of warm air equipment.

**REX AIR-PAK—in three styles—complete range of sizes.** Standard series, with or without louvres as desired, provides generous air chamber and filter area — Rival series, offers a full size blower in a cabinet designed to fit in a small floor space—Junior series, to help you meet chain store competition in the small home market.

**REX Merchandising Program.** Engineering service, consumer literature, newspaper mats—and the always helpful sales aid—"The ABC of Winter Air Conditioning." Write for samples—and your REX AIR-PAK catalog today. Address—dealer sales dept.

**Air Controls Inc.**
DIV. OF
THE CLEVELAND HEATER CO.
**1933 West 114th St. Cleveland, O.**

This is
Superior Checker
Coat
A sheet finding increased favor among artisans who keep their work out of the "ordinary" class in appearance as well as quality. Superior Checker Coat combines a most distinctive appearance with the same uniform, high quality of all Superior Galvanized Sheets. It is galvanized by the Superior Process with a distinctive bright spangle in pronounced individual squares or checkered blocks. It is made of the same special analysis open hearth steel rolled to a uniform gauge and correctly tempered for superior fabricating qualities.
Superior Coated Sheets—including Superior Galvannealed, Commercial Quality Galvanized, Copperior, Tite and Extra Tite Coats—are noted for uniformity of gauge, temper and coating. Every shop test proves their economy. Distributors in principal cities.
THE SUPERIOR SHEET STEEL CO. • CANTON, OHIO
DIVISION OF CONTINENTAL STEEL CORP., U. S. A.
SUPERIOR
OPEN HEARTH STEEL SHEETS
THE SUPERIOR SHEET STEEL CO.
CHECKER COAT
TRADE MARK REG. U.S. PAT. OFF.
CANTON, O.

# IMPROVED PRODUCT

ADVERTISERS experienced in profitably cultivating selected markets know that publication members of The Associated Business Papers are tops in their fields. They know that the A.B.P. symbol stands for honest, known paid circulation; straightforward business methods and editorial standards that insure reader interest.

But A. B. P. members know that, in changing times, they cannot rest upon the laurels of past achievement or present recognition. This very year they have modernized the CODE AND STANDARDS OF PRACTICE upon which their service to readers has been founded. Guide-posts of ethical business paper publishing for 23 years, these Standards have been made stronger and more enforceable than ever before.

Read them and you'll understand the sincerity with which A.B.P. publications are constantly striving to improve their worth to readers . . . their value as advertising media.

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1 To consider, first, the interests of the subscriber.

2 To subscribe to and work for truth and honesty in all departments.

3 To endeavor to be a leader of thought in his editorial columns, and to make his criticisms constructive.

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5 To avoid unfair competition.

6 To determine what is the highest and largest function of the field which he serves, and then to strive in every legitimate way to promote that function.

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¶4 To promote and sell his own publication solely upon its merits; to make no misrepresentations either in the use of research data and survey results, or otherwise; to employ no advertising or personal selling methods which are unfair to other publications and advertising media.

¶5 To make available to advertisers full information regarding character and extent of circulation, including detailed circulation statements, subject to proper and authentic verification; and to maintain effective control over circulation sales channels to the end that (a) subscriptions will be solicited only from individuals and firms interested in the field or industry served by the publication; (b) any premiums offered will not be introduced into any sales combination to the extent that the paper is bought mainly to secure the premium; (c) the amount of commission paid salesmen shall not be so great as to encourage price-cutting to obtain a subscription order.

## AMERICAN ARTISAN

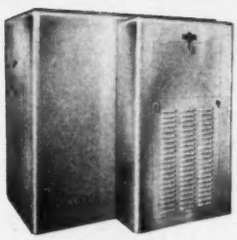
***Member of The Associated Business Papers • Inc.***

# WILLIAMSON

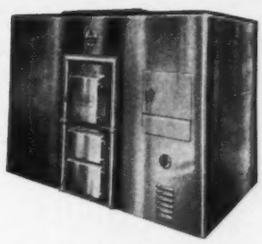
## *The World's Finest Line*

**WARM AIR HEATING AND AIR CONDITIONING EQUIPMENT**

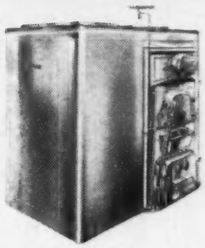
Gas-fired "FLO-WARM" Air Conditioning Unit



Oil-fired "FLO-WARM" Air Conditioning Unit



Stoker-fired "FLO-WARM" Air Conditioning Unit



Hand-fired "FLO-WARM" Air Conditioning Unit

"TRIPL-IFE" 20 Year Guaranteed Gravity Furnace

### *To be a Leader — Do What the Leaders do!*

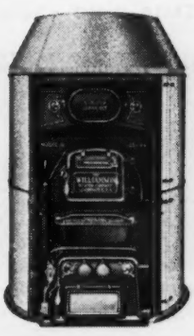
Find out for yourself why Williamson Dealers lead the field of Warm Air Heating and Air Conditioning — how they merchandise the finest products — how they specialize in making money.

Fine Merchandise — Advanced Engineering — Modern Sales Methods; these things make Williamson Factory Trained Dealers stand out for their ability.

Then check up on Williamson Products and you will sell yourself on Quality, Design, Workmanship and Finish. The profit is there too, as you will discover.

Start today doing "What the Leaders Do". A card will bring you the facts you need for a successful Heating Business.

Send for these new books—showing complete lines of pipe, duct and fittings for all gravity and air-conditioning jobs.



Model "A" Cast-iron Furnace

"A" Series, Boiler-plate Furnace

TRIPL-IFE

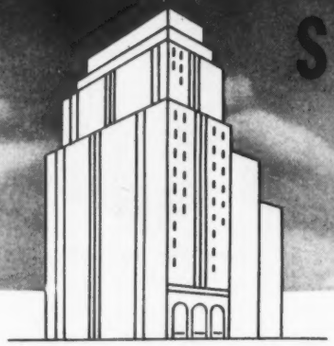
**THE WILLIAMSON HEATER COMPANY**
**CINCINNATI, OHIO**
**DEALERS AND DISTRIBUTORS EVERYWHERE**

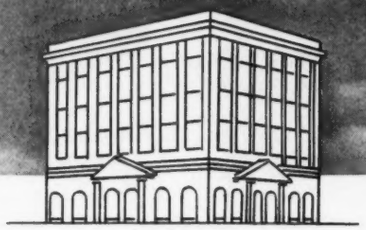
FLO-WARM

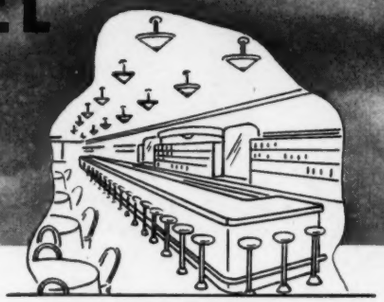
# You can make more money installing

# Enduro

## STAINLESS STEEL







### In Every Office

During the last ten years few new office buildings have been erected. Consequently, operators of old buildings, new tenants and old tenants with favorable leases, are modernizing old offices. Here you can use ENDURO* Stainless Steel to advantage for wall panelling, chair rails, kick plates, doors, decorative panels, grilles, stair rails, lighting fixtures and a host of other applications where its silvery beauty and long life make it the ideal metal.

### In Every Bank

From the lettering on the front of the building, through the banking room and into the safe deposit vault the uses for Republic ENDURO are many. It decorates entrance doors. It withstands the abrasion of money at the tellers' windows. It solves the cleaning problem when used to cover columns and ceilings. To deposit boxes it lends an air of stability and quiet dignity.

### In Every Bar

Three qualities of ENDURO make it the logical metal to use wherever beverages or food are served — resistance to corrosion, ease of cleaning and inviting appearance. You will find it easy to sell on its merits for bar and table tops, back bars, sinks, railing, bar decorations, serving trays, shelving, and food storage containers. Ask us to send you illustrations showing how other sheet metal contractors have used ENDURO for these purposes.

**REPUBLIC STEEL CORPORATION**

GENERAL OFFICES: CLEVELAND, OHIO • ALLOY STEEL DIVISION: MASSILLON, OHIO

ENDURO doors, lighting fixtures and bands around the walls brighten this office reception room.

The ceiling and columns of this bank are glistening long-lasting ENDURO.

For serviceability, beauty, and ease of cleaning ENDURO for the backbar and counter front and top.

REG. U. S. PAT. OFF.

REPUBLIC STEEL

*Reg. U. S. Pat. Off.

Republic makes a complete line of black, galvannealed and galvanized sheets of steel and rust-resisting Toncan Copper Molybdenum Iron. Also Taylor roofing ternes.

BERGER MANUFACTURING DIVISION
NILES STEEL PRODUCTS DIVISION • TRUSCON STEEL CO.
UNION DRAWN STEEL DIVISION • STEEL AND TUBES, INC.

A very practical booklet telling how to fabricate stainless steel will be sent to you upon request.

AMERICAN ARTISAN

Volume 108 Number 8

# A Challenge From Low Cost Housing

IN 1937 the "average" small house, built under FHA guaranteed financing, cost $5,500 according to the Federal Housing Administration. In 1938, this same "average" small house cost slightly less, or about $4,500 to $5,000, according to the same authority.

What this "average" small house will cost in 1939 is, of course, as yet undetermined, but the emphasis all along the line has been on lower and lower cost houses.

It has been reported, on good authority, that FHA feels its efforts, up to date, to build houses for owners of low incomes has been a failure because FHA desires the construction industry to demonstrate that attractive, saleable houses **can** be built for less than $3,000.

The editorial staff of this publication, visiting many cities and small towns during the past six months, has been careful to observe trends in house costs. Within our observation, the $3,000 house is still impractical. True, some houses in this cost range have been found but, as a general rule, the $3,000 selling price was met by leaving attics unfinished, wiring or painting or decorating to be done by the owner after he moves in, or by omitting garages, basements and by other subterfuges.

We speak of the northern part of the country where a house must be reasonably well built to insure comfort during winter; where an adequate heating plant is essential to owner comfort; and where construction materials and labor fall within the so-called "high cost bracket." In southern sections, houses can be built without basements, labor costs are lower than up north, materials are somewhat lower or "substitute construction" can be employed—all of which mean lower building costs.

As now in force, the FHA act distinguishes sharply between the house costing less and the house costing more than $6,000. Above $6,000, recognized types of design and construction are demanded and, accordingly, established equipment and established design seem to be quite satisfactory.

In the price range from $4,500 to $6,000, however, the whole building industry is now in a dither. Giving more house by cutting architectural attractiveness; eliminating features the American home owner has always considered essential (dining rooms, basements, generous room sizes); substituting newer materials for time-proved materials; are only a very few of the corner-cutting methods now in vogue.

Much as many of us may look askance at these practices, we must admit that the $5,000-$6,000 house seems to be here to stay. If it is permanent, it seems as though the heating industry has a real man's sized job cut out for itself. Older types and sizes of furnaces do not entirely fill the bill. Capacities are often far too great. Physical dimensions of many furnaces are all out of proportion to spaces allotted. Hand firing is taken (often without much grace) but the demand is definitely for automatic forms of heat generation. Appearance must be made to conform with today's bright colors; "streamlining" now so popular must be applied to heating equipment; ornamentation is coming into favor.

These few present day demands, plus other demands every contractor meets daily, have become a challenge to the heating industry. Many manufacturers have been engaged in revamping their equipment for some time past. Others, not so quick to realize the changes, have not yet seen fit to abandon models formerly popular.

But the industry's thinking must go beyond revamping of equipment. We must revamp our whole procedure of design. Present day duct systems (complicated as they are) may soon be as out of place in the $5,000-$6,000 house as now are the first 400-foot velocity duct systems for fan application or the "octopus" gravity systems which used to take up all the room in the basement.

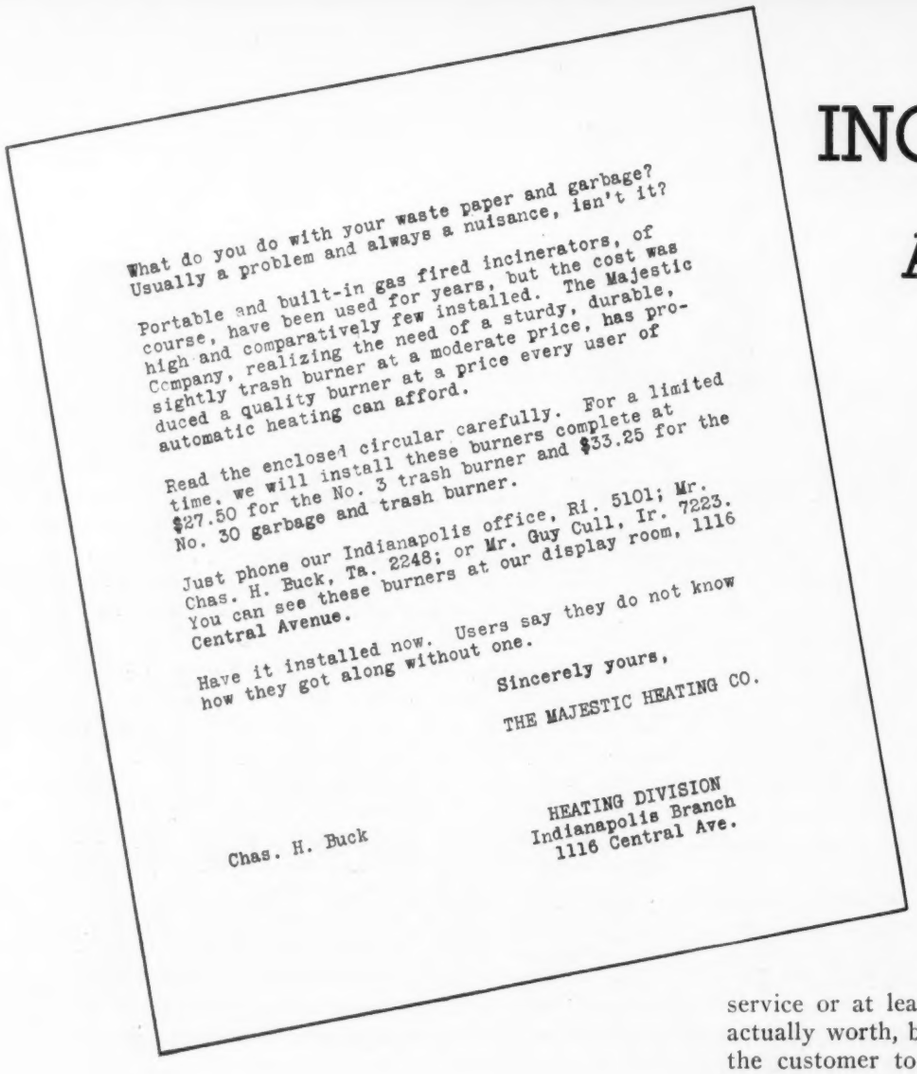
If owners of new houses are to enjoy the air conditioning comforts this furnace industry has so well popularized, this same industry must undertake the still bigger job of selling the owner and builder on the idea that air conditioning is by far the most important physical function of the house and, accordingly, it is not asking too much to demand that the house be built around the air conditioning system rather than the conditioning system jig-sawed into the house after everything else has been provided for.

If the furnace heating industry can sell this idea, then compact systems with a few feet of duct work, smaller ducts, fewer fittings, will simplify installation and make it possible for furnace men to meet easily any requirement in housing cost.

# INCINERATORS

## A Slack Season Sales Possibility

By Chas. H. Buck
Indianapolis, Ind.



What do you do with your waste paper and garbage?
Usually a problem and always a nuisance, isn't it?

Portable and built-in gas fired incinerators, of course, have been used for years, but the cost was high and comparatively few installed. The Majestic Company, realizing the need of a sturdy, durable, sightly trash burner at a moderate price, has produced a quality burner at a price every user of automatic heating can afford.

Read the enclosed circular carefully. For a limited time, we will install these burners complete at $27.50 for the No. 30 garbage and trash burner.

Just phone our Indianapolis office, Ri. 5101; Mr. Chas. H. Buck, Ta. 2248; or Mr. Guy Cull, Ir. 7223. You can see these burners at our display room, 1116 Central Avenue.

Have it installed now. Users say they do not know how they got along without one.

Sincerely yours,

THE MAJESTIC HEATING CO.

Chas. H. Buck

HEATING DIVISION
Indianapolis Branch
1116 Central Ave.

LIKE most contractors in the residential heating field, our organization has always had recurring seasons when jobs are scarce and work slack and, like most contractors, we have constantly been on the lookout for some product or service which could be merchandised in these slack seasons. This product or service should, in our estimation, be allied with the heating business and should, if possible, help to advertise the contractor as a heating specialist and not link the contractor's name with some activity completely foreign to heating.

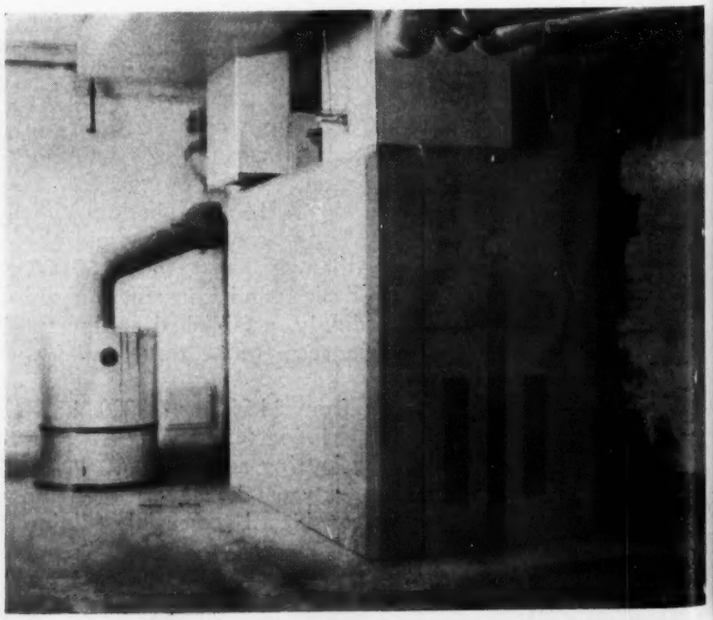
In past years our organization has staged special drives and special summer prices and financing, but, in spite of our best efforts, the home owners of Indianapolis still let work on their heating plants go till Fall or until heating is required. As a result of our efforts in these campaigns, we have come to the conclusion that we can't change human nature and our only hope, then, is in the sale of some product or service badly needed during the summer.

### Putting Service Calls to Work

Our records also show that during the course of a year we make a good many calls on our customers to service equipment, or to check on operation, or make minor adjustments. We can't charge for such service or at least not charge what such a call is actually worth, but we can use the time spent with the customer to talk some additional product or service if this means a profit and another contact with our customer.

### Automatic Heat Users Have a Rubbish Problem

In the time we have been selling automatic heating in Indianapolis, we have become conscious of the fact that automatic heat (meaning oil and gas) seems to have one failing insofar as the owner of a previous hand-fired furnace is concerned. That failing is the inability of the owner to dispose of



rubbish and garbage in his new furnace. Where he formerly was able to burn practically everything except cans in his furnace, he now finds with his gas or oil furnace that he has a garbage and rubbish disposal problem on his hands. Some of our automatic heat customers still insist on burning trash in the furnace and the results can easily be imagined.

Some time ago we began looking into this problem. We considered an incinerator, but units which could be moved into the basement and set up at a minimum of cost and which would sell at a price which would not require a major selling effort on our part, did not seem available. Some months ago the incinerator we handle (Majestic) was announced at a price which seemed to meet our requirements. We decided to try our ideas.

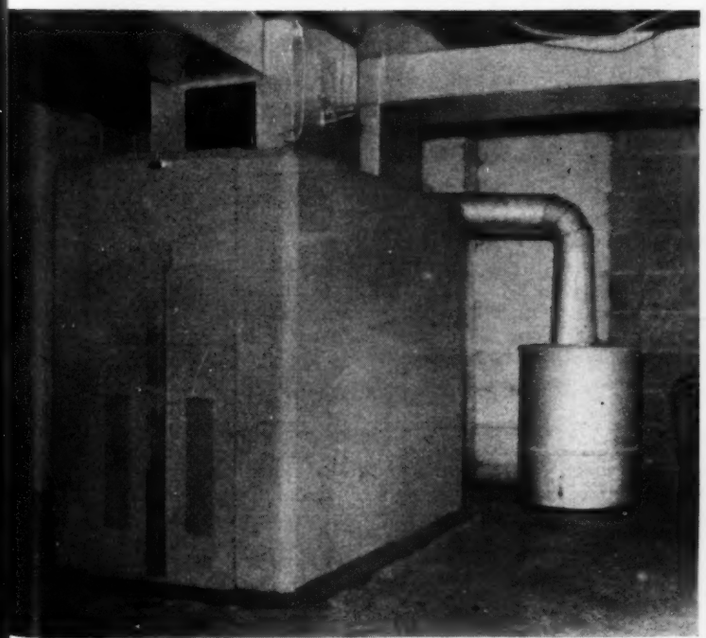
### Building the Prospect List

We took our list of customers having automatic fired furnaces and selected fifty names which, our call reports showed, either had talked about rubbish disposal or should be interested. To each of these fifty home owners we sent an individually typed letter and an envelope stuffer telling about the incinerator. Our plan was to follow up each of these letters with a personal call as rapidly as possible, but during the first week we received twelve calls from customers we had not yet contacted. We changed our order of call to visit these twelve immediately and as a result sold six incinerators.

The letter stated that two types of units were available and gave a set, installed price. The six units sold were all the most expensive and were sold for $33.25 each. Our factory cost is $19.98 so our gross profit on each unit is $14.27. The cost of sending the letters was just about $3.00, so our net return for the first six units sold is $85.62 minus $3.00.

### Cost of Installation

The retail price, without installation, of this unit is $29.95, leaving $3.30 for installation. Since we have to set the unit, connect the flue into the chimney or smoke pipe, this may seem a little low, but our plan has been to keep costs as low as possible and try to sell volume. So far in our program this seems to have worked out satisfactorily. We can't always keep installation under $3.30, but installations running over are so far balanced by installations running under.



While this campaign was under way we began to speculate on the probable success of a campaign of personal calls without any introductory letters. So we selected ten names from our list of automatic firing customers and made a call on each one. Eight of the ten were definitely interested in our suggestion. Two used vacant lots adjoining and so turned us down. Two of the eight interested were sold on the first call. Two told us to come back and four asked for time to consider.

Since we went into this incinerator program as a means of building slack-season sales and in order to keep our name before customers and prospects, we have not forgotten to utilize the time given us to talk warm air heating, air conditioning, automatic heating. In every call we have asked for names of friends or relatives who are in need of new heating equipment. Our list of prospects has been definitely enlarged as a result.

### Incinerators Lead to Heating Sales

Also each incinerator call or sale has given us an opportunity to request a visit to the basement. Once in the basement we have inspected the furnace, whether customer or prospect, and plan to use information thus gained in future calls to talk heating. As an illustration, one call was made on an owner of a hand-fired coal furnace. We talked incinerator and sold one. After installation we made our customary routine call-back and steered the conversation to automatic heating and winter air conditioning. This man became so interested that we feel sure he will buy before the coming heating season.

Up to date the two most common questions are: "Does the incinerator burn all rubbish and garbage?" and "Is there any odor?" The units we have installed definitely do consume everything except metal and require no fuel except the paper, trash, rubbish, garbage put in the incinerator. In our average installation it takes two or three days accumulation to fill the unit, by which time wet garbage has partly dried out and all that remains after firing is a little ash. Ash removal seems to be once every two or three months.

### Odor? There Is None

As to odor, we connect each incinerator to an unused chimney or flue if possible and, where we cannot do this, tap into the furnace flue. We have not found that this reduces the furnace draft objectionably. The incinerator gets its air for draft from the basement so all odor travel is outward.

In Indianapolis, garbage removal is free of charge, but not frequent enough to prevent all odor in hot weather. In towns where a charge is made for removal, or where service is not as frequent as ours, these incinerators should be even more saleable than we have found them to be.

*The Proposed*

# Michigan State Licensing Ordinance

**Part I of this proposed Michigan state licensing law was published in the July issue. This group of sections completes the law as proposed. According to our last information, this law was not acted upon at this session of the Michigan legislature, but will be ready for early action in 1940. Since copies are not available, readers are asked to save these two issues if interested in this state law.**

### Section 12. License.

No person or firm shall engage in the business of installing, maintaining, altering, repairing or extending or installing any additional equipment in connection with any new or existing gravity warm air heating or air conditioning system within the purview of this act without having first obtained from the board a contractor's license and a certificate therefor. Each person or firm operating more than one contracting establishment in the State for carrying on the business of gravity warm air heating and/or air conditioning contracting shall be required to secure a license for each such establishment. There shall be two classes of licenses; Class I and Class II. Class I license shall cover the installation, maintenance, alteration, repair and extension; or the installation of any additional equipment or apparatus in connection with any work within the purview of this act. Class II license shall cover the installation, maintenance, alteration, repair and extension; or the installation of any additional equipment or apparatus in connection with gravity warm air heating only.

### Section 13. Classes of Licenses and Fees.

Before a license may be granted to any applicant and before any expiring license may be renewed, the applicant shall pay a fee in such amount as is herein specified for the class of license granted or renewed as follows: For Class I, thirty-five ($35.00) dollars; for Class II, twenty-five ($25.00) dollars. If the principal place of business of the person, firm or corporation making application for a Class I license is within the corporate limits of a city or village where inspection is established by ordinance, fifty per cent (50%) of the annual license fee of that applicant shall be turned over to the treasurer of that city or village to assist in defraying the expenses of the inspection department and the remaining fifty per cent (50%) shall be paid into the general fund of the State of Michigan. Each license shall expire on December 31st following the date of its issuance and shall be renewed by the board upon application of the holder of the license and the payment of the required fee at any time within thirty (30) days before the date of such expiration. Licenses not renewed by the first day of February next following their expiration shall require that the licensee shall have to make application and otherwise comply with the same requirements as in applying for a new license.

### Section 14. Application for License.

Each application for a license must be made in writing to the board or to a municipal or district board of examiners appointed by the board. Applications must be made in the form as prescribed by the board which shall include the name of the representative of the applicant who will take the examination and who will act as supervisor of all work to be done under the license. Said application must be accompanied by a surety bond from an approved surety company guranteeing that all work installed under said license will be in conformity with the rules established hereunder. Said bond shall be in the sum of two thousand ($2,000.00) dollars.

$ 2,000 on Class 1
$ 1,000 on Class 2
$15,000 maximum for company operating branches on Class 1
$10,000 maximum for company operating branches on Class 2

### Section 15. Examinations.

The designated representative of each applicant for a license shall be examined by the board or by a municipal or a district examining board appointed by the board to determine his knowledge of the required standards for the installation of all work prescribed under the authority of this act and to determine the general qualifications and fitness of the applicant for executing work to be done under the license. The examination shall be written and the questions used shall be prepared by the board and all examinations shall be conducted in accordance with rules and regulations established by said board. At least one examination shall be held during each calendar month provided there are pending applications for licenses. A complete record of every examination shall be kept on file for at least three years.

### Section 16. Certificate of License.

Each certificate for a license issued in accordance with the provisions of this act shall specify the name of the person, firm or corporation licensed who shall be known as the holder of the license and shall specify the name of that person who has passed the examination, and who will act as supervisor of all work to be done under the license. Two firms or corporations may not have the same supervisor and if the business association of said supervisor with the holder of the license shall terminate, said license shall become null and void thirty (30) days after such termination unless another licensed supervisor is qualified. Every holder of a license shall keep his, their or its certificate of license displayed in a conspicuous place in his, their or its principal place of business.

### Section 17. Inspector's Certificate of Qualification.

No person shall be employed by any municipality, or by the State of Michigan as an air conditioning inspector without first having secured from the board an inspector's cer-

tificate of qualification except that any person, who on the date on which this law went into effect was serving as a legally appointed municipal inspector, shall upon application and payment of the prescribed fee and without examination, be issued a special certificate permitting him to continue to serve in such position. The requirements for obtaining an inspector's certificate of qualification shall be as follows: The applicant shall be a competent mechanic of good moral character, shall be possessed of such executive ability as is requisite for the performance of his duties, shall have a thorough knowledge of the required standards of both the materials and the methods used in the installation of gravity warm air heating and air conditioning equipment, shall have had at least five years' experience as an inspector or in the installation of air conditioning systems; or in lieu of such five years' experience shall be a graduate of some recognized engineering college and shall have had two years' practical experience; and shall pass a written examination given by the board.

Before an air conditioning inspector's certificate of qualification is issued to any applicant he shall pay to the board a fee of five ($5.00) dollars. Each inspector's certificate of qualification shall continue in force until suspended or revoked by the board or until a period of twelve months has elapsed during which time the holder of the certificate shall not have been employed as an inspector. Any inspector's certificate of qualification may be suspended for a definite length of time or revoked by the board after a hearing if the holder of such certificate fails to properly perform his duties as an inspector in conformity with the provisions of this act.

### Section 18. Records of Board.

Records of the meetings of the board shall be open for inspection at all times. The board shall keep a record of all licenses and certificates issued by it and shall have printed a manual of its rules and regulations for the conduct of examinations.

### Section 19. Revocation and Suspension of Licenses.

No license and certificate therefor issued in accordance with the provisions of this act shall be assignable or transferable. Any such license may, after hearing, be suspended for a period of not over thirty (30) days or revoked by the board or by a municipal or a district examining board if the person, firm or corporation holding such license willfully or by reason of incompetence, violates any statute of the state or any ordinance, rule or regulation of any municipality of the state or any order of the board pertaining to the installation, maintenance, alteration or repair of gravity warm air heating and air conditioning equipment; provided that an appeal from such decision on the part of a local board may be made to the board which shall conduct a rehearing and render a final decision.

### Section 20. Continuance of Municipal Licensing Provisions.

In every municipality in the state, where, at the time when this act goes into effect, it is required by ordinance that persons, firms or corporations engaged in the business of installing gravity warm air heating and/or air conditioning equipment shall be licensed by the municipality to so engage or where any form of license is by ordinance required in order to undertake or perform the installation of gravity warm air heating and air conditioning equipment, every such license which has been issued prior to the date upon which this act goes into effect shall continue in force until the date of its expiration according to the ordinance under which it was issued, except that no such license shall continue in force for a period of more than one year after the date upon which this act goes into effect, and thereafter no such license shall be required by the municipality.

### Section 21. Disposition of Fees, Appropriation.

Except as provided in Section 12, all sums received by the board in the form of fees or from any other source shall be paid into the general fund of the state and are hereby appropriated from the general fund for the use of the board in carrying out the provisions of this act and shall be paid out by the state treasurer upon vouchers approved by the chairman of the board to meet the payment of all expenses actually incurred.

The sum of ten thousand ($10,000.00) dollars is hereby appropriated from the general fund of the state to be available when this act goes into effect and to be used by the board in defraying any expense that may be incurred by the board in the administration of this act before sufficient funds have been collected from fees as hereinbefore provided. One half of the license fees retained by the state shall be credited to this special appropriation until the ten thousand ($10,000.00) dollars is fully restored to the general fund. No expense or claim shall be incurred or paid in excess of the amount received from the fees herein provided.

### Section 22. Penalties.

Any person, firm or corporation who shall violate any of the provisions of this act shall be guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not less than twenty-five ($25.00) dollars or more than fifty ($50.00) dollars or imprisonment in the county jail for not more than thirty (30) days or both fine and imprisonment at the discretion of the court. If such person, firm or corporation is the holder of a license of any class provided for in this act, such conviction shall have the effect of suspending said license until such time as it shall have been reinstated by the board. Each violation shall be considered as a separate misdemeanor.

### Section 23. Liability for Damage.

This act shall not be construed to relieve from or lessen the responsibility or liability of any party owning, operating, controlling or installing any gravity warm air heating and/or air conditioning equipment for damages to persons or property caused by any defect therein, nor shall the state or any municipality be held as assuming any such liability by reason of the inspection or the examination authorized herein or the certificate of approval or the license and certificate issued therefor as herein provided.

### Section 24. Validity.

If any section, sub-section, sentence, clause or phrase of this act is for any reason held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this act. The legislature of the state hereby declares that it would have passed this act and each section, sub-section, sentence, clause, or phrase thereof, irrespective of the fact that any one or more sections, sub-sections, sentences, clauses or phrases be declared unconstitutional.

### Section 25. Repeal of Conflicting Acts.

All acts or parts of acts conflicting with the provisions of this act are hereby repealed.

### Section 26. Date to Take Effect.

This act shall take effect —— days after its passage and publication.

**Since American Artisan first began to advocate codes and licensing in 1931, a number of cities have passed codes and a still greater number of communities are engaged in the necessary preliminary work. A recently passed law is that of Columbus, Ohio. This law will be published in full, next.**

*The Proposed*

# Michigan State Licensing Ordinance

**Part I of this proposed Michigan state licensing law was published in the July issue. This group of sections completes the law as proposed. According to our last information, this law was not acted upon at this session of the Michigan legislature, but will be ready for early action in 1940. Since copies are not available, readers are asked to save these two issues if interested in this state law.**

### Section 12. License.

No person or firm shall engage in the business of installing, maintaining, altering, repairing or extending or installing any additional equipment in connection with any new or existing gravity warm air heating or air conditioning system within the purview of this act without having first obtained from the board a contractor's license and a certificate therefor. Each person or firm operating more than one contracting establishment in the State for carrying on the business of gravity warm air heating and/or air conditioning contracting shall be required to secure a license for each such establishment. There shall be two classes of licenses; Class I and Class II. Class I license shall cover the installation, maintenance, alteration, repair and extension; or the installation of any additional equipment or apparatus in connection with any work within the purview of this act. Class II license shall cover the installation, maintenance, alteration, repair and extension; or the installation of any additional equipment or apparatus in connection with gravity warm air heating only.

### Section 13. Classes of Licenses and Fees.

Before a license may be granted to any applicant and before any expiring license may be renewed, the applicant shall pay a fee in such amount as is herein specified for the class of license granted or renewed as follows: For Class I, thirty-five ($35.00) dollars; for Class II, twenty-five ($25.00) dollars. If the principal place of business of the person, firm or corporation making application for a Class I license is within the corporate limits of a city or village where inspection is established by ordinance, fifty per cent (50%) of the annual license fee of that applicant shall be turned over to the treasurer of that city or village to assist in defraying the expenses of the inspection department and the remaining fifty per cent (50%) shall be paid into the general fund of the State of Michigan. Each license shall expire on December 31st following the date of its issuance and shall be renewed by the board upon application of the holder of the license and the payment of the required fee at any time within thirty (30) days before the date of such expiration. Licenses not renewed by the first day of February next following their expiration shall require that the licensee shall have to make application and otherwise comply with the same requirements as in applying for a new license.

### Section 14. Application for License.

Each application for a license must be made in writing to the board or to a municipal or district board of examiners appointed by the board. Applications must be made in the form as prescribed by the board which shall include the name of the representative of the applicant who will take the examination and who will act as supervisor of all work to be done under the license. Said application must be accompanied by a surety bond from an approved surety company guranteeing that all work installed under said license will be in conformity with the rules established hereunder. Said bond shall be in the sum of two thousand ($2,000.00) dollars.

$ 2,000 on Class 1
$ 1,000 on Class 2
$15,000 maximum for company operating branches on Class 1
$10,000 maximum for company operating branches on Class 2

### Section 15. Examinations.

The designated representative of each applicant for a license shall be examined by the board or by a municipal or a district examining board appointed by the board to determine his knowledge of the required standards for the installation of all work prescribed under the authority of this act and to determine the general qualifications and fitness of the applicant for executing work to be done under the license. The examination shall be written and the questions used shall be prepared by the board and all examinations shall be conducted in accordance with rules and regulations established by said board. At least one examination shall be held during each calendar month provided there are pending applications for licenses. A complete record of every examination shall be kept on file for at least three years.

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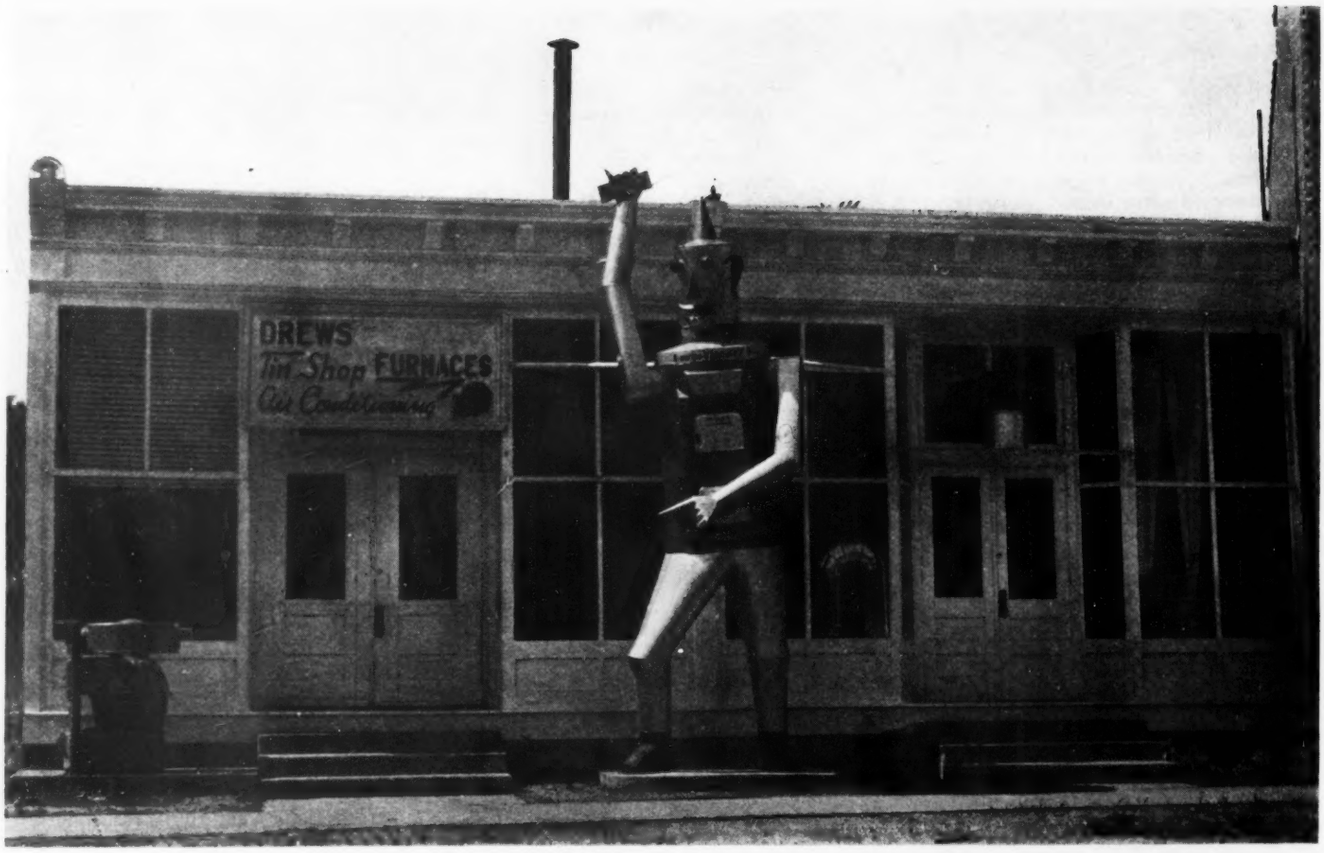



# A "Sheet Metal Man" 18 Feet High

THE largest "sheet metal man" this magazine has so far heard about stands in front of the shop and office of Air Conditioning and Furnace Co., in Danville, Illinois. Everything about this man is large—he stands almost 18 feet high (nearly as tall as the shop building) his body is built from a 30-inch furnace casing, the head is a 20 by 30-inch drum, the legs are 68 inches long and 14 inches in diameter at the knee.

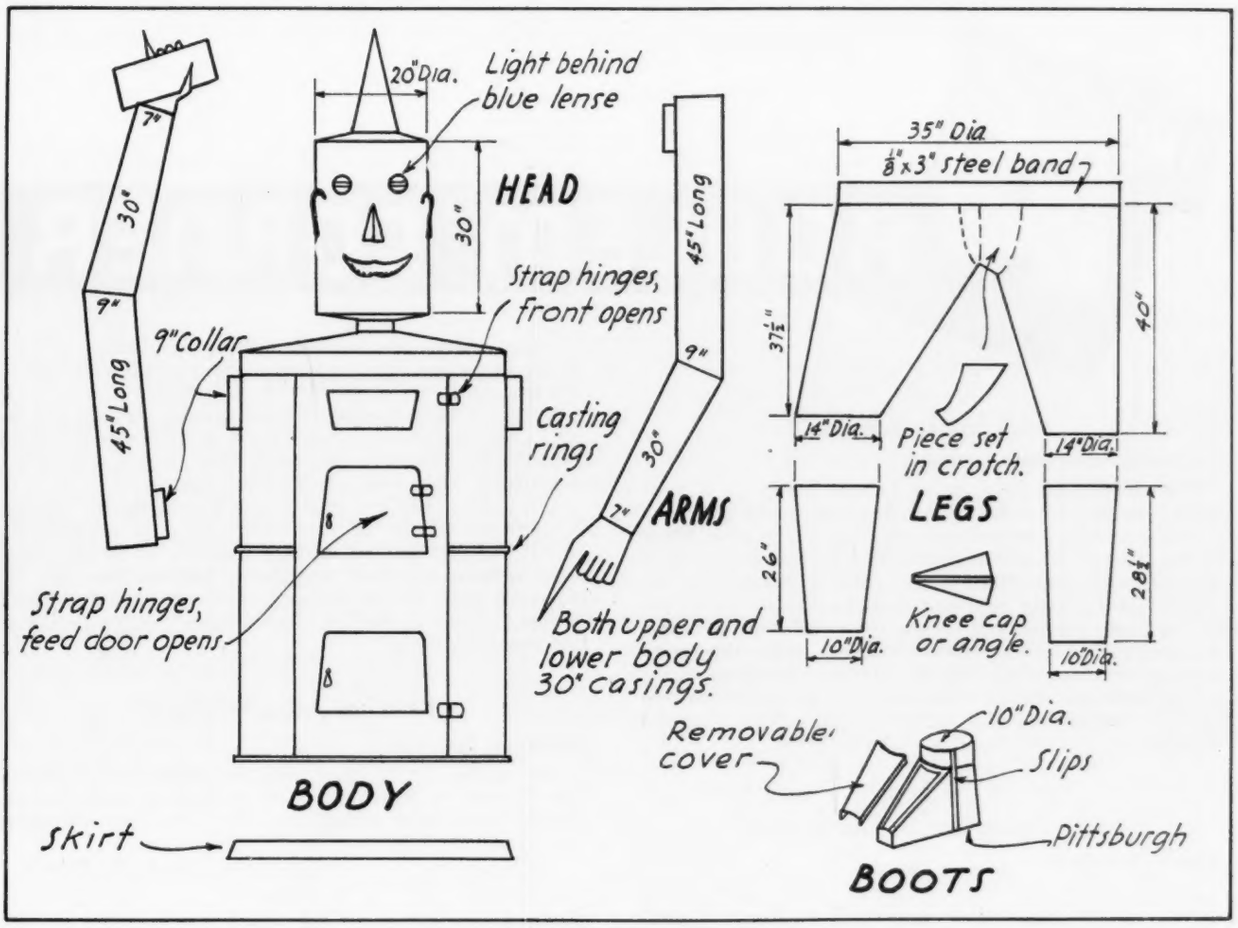
Herb Drews, owner of the company, wanted a metal man for advertising purposes, but being unable to find an example of the size in mind, used his imagination and materials lying around the shop and spent several months of spare time workng out his plans.

Beginning with the preliminary sketch, the head was made first by cutting a slit for the mouth and cutting out a separate V for the nose. The V nose was soldered on the drum, as pictured; the eyes were made from small collars cut to fit the drum and soldered on. The slotted mouth did not look just right, so Mr. Drews cut out the lips shown and soldered these on the drum. Next was added a long funnel for a hat and this assembly was placed on the furnace casing so that the head can be rotated in any direction.

Several months went by after this, but during the winter the hands and arms were fabricated as shown in the sketch; the ash door, feed door humidifier door were hinged on the casing and the half-man so assembled was placed on a float in the Labor Day parade. One of Mr. Drews' mechanics rode inside the man in the parade and spoke to the crowds through an amplifier. He also made the head move from side to side to make the man more life-like. This piece of advertising received nice publicity in the Danville paper.

Mr. Drews then decided to complete the man, adding legs, so that the finished metal man could stand outside the shop and advertise the business. As the photograph and drawing show, the upper part of the legs is built as a large, round pipe Y. The calves are tapered round pipe, of dimensions shown, and the boots are made up according to the sketch. The fingers are funnels, about 12 inches long and one hand is arranged to hold a small sign which reads—"Service."

The arms are adjustable and Mr. Drews plans



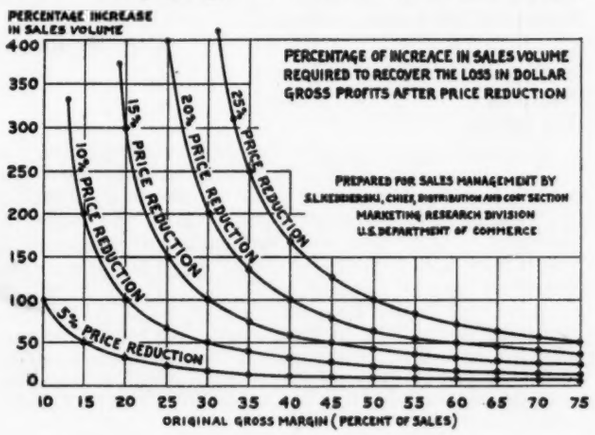

**The photograph opposite shows the completed "sheet metal man" in front of Mr. Drews' shop. He almost "tops" the building. Above are sketches of parts showing dimensions and construction.**

to install a motor inside which will rotate the head and at least move the left arm through a small arc. Two small light bulbs are placed behind the blue lenses of the eyes; there are two holes in the nostrils and the light reflects red through the mouth and nose.

As assembled, the sheet metal man represents a furnace and many of the fittings used in a typical installation. In front of the building the man stands with one foot advanced as though walking and the left hand points into the shop door as though saying that "Service" is the creed of this establishment. The sheet metal man is also used on all of the firm's stationary.

# Sales Increases Required to Offset Price Reductions

READERS who conduct establishments from which packaged items are sold over the counter, or jobbers who sell standard lines of products used by the furnace or sheet metal contractor, frequently run "sales" in which a "10 per cent reduction" in price is offered as an attraction.



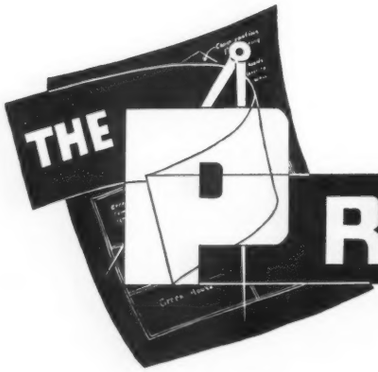

The problem then is—how much must sales be increased to obtain a dollar profit equal to the lesser volume at the higher price?

The answer hinges on how much was the original gross margin (per cent of sales). By margin or per cent of sales is meant—if you sell an item for $1.00 which cost 75c to make, your margin is 25 per cent.

The accompanying chart is useful in determining the answer to this problem—and the answer you will get may surprise you.

For example, let us say you are selling lengths of smoke pipe over the counter and are asking $1.00

(*Continued on page* 112)




## April Smoky Furnace

American Artisan:

The problem of the smoking furnace presented in your April issue and answered in the May issue seems quite like a similar problem we encountered some years ago. Many of the furnaces of the type described have a smoke collar which extends through the casing. When we inspected the trouble job carefully we found that the mechanics had put on the smoke pipe so that the pipe extended into the casing and was rather loose around the collar. After the rooms came up to temperature and the fire was checked the smoke seeped back into the air space and into the bathroom pipe nearby. Putting the pipe tightly on the collar solved the problem. R. S. RAYMER, Lena, Ill.

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## Open Return Ducts

American Artisan:

I would like to know if you have any information on the method of returning cold air by way of small 5 by 12-inch cold air ducts dropped to within 12 inches of the basement floor; air to be taken into the casing through filters placed around an opening cut through the casing. We are installing a furnace in a low basement (about 6 feet of head room) and one return air pipe must come through a passage and so would necessitate ducking under the pipe.

One of our local companies is using this method. The men say these installations work all right. On the other hand a furnace man who travels widely raises several objections such as transmitting odors, basement air will have to be heated, filters fill up rapidly and restrict air flow. There are three other returns which we can pipe to the furnace without trouble, but if three returns are closed and one is open what will be the result?

F. A. J., Wisconsin.

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Reply by
The Editors

We have consistently condemned this idea ever since it was first introduced some five years ago.

Those individuals who have argued against the plan as outlined in your letter have our full support and in addition to their objections of having to heat the basement air, transmitting basement odors and rapid filling up of filters, we would like to add that our chief objection comes from the fact that with this type of return you have absolutely no control over the amount of air which you withdraw from any one portion of the house. In other words, there is no means by which you can balance your return system and, unless the job works 100 per cent satisfactorily, it is usually necessary to choke down some returns and leave others wide open.

Another serious objection is the fact that if the basement stair door is left open, you throw the complete return system out of balance and if the basement door is leaky or if there is a short path of air flow from outside windows to the casing, you can never hope to return air from some areas where it may be absolutely necessary to withdraw air. In many cities this system is contrary to fire restrictions because it does offer a very definite fire hazard because of the flue effect of open returns should a fire originate in the basement.

With specific reference to your problem, if you can install closed returns from some areas of the house, we would take the full return volume from these areas and leave the areas from which you cannot return alone.

We believe that this system was first suggested because it offers one way to cut installation costs. As you probably know, the first systems consisted simply of an open register without any duct whatever. Because this idea did not work at all, it was later modified to include a duct which dropped down to within approximately twelve inches of the basement floor.

◆

## Rats Eat Asbestos Paper

American Artisan:

We would like to know what treatment or precautions can be used to prevent termites or rodents destroying asbestos paper when pasted on ducts. Probably something can be added to the paste used on this paper.

W. L. T., Florida.

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Reply by
The Editors

The Grant Wilson Company, Chicago, manufacturers of asbestos paper and insulation, state that their cold water paste has a small amount of arsenic mixed into the powder for the purpose of keeping rats away from the paper. The company says that rats eat the paste and paper and to prevent this they suggest that you add a generous handful of powdered arsenic to each pound of the powdered paste and see if this will not keep rats away.

We have no experience with termites, but you might write to T. E. Snyder, Senior Entomologist, Forest Insect Investigations, United States Department of Agriculture, 837 Gravier St., New Orleans, La.

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## Baffling Gravity Furnaces

American Artisan:

Can you tell us how to properly baffle a gravity furnace when converting to forced air? How close should the inner liner be to the heating surfaces?

K. A. M., Iowa.

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Reply by
The Editors

We attach tear sheets of a series of articles published in 1935 on the subject of baffling gravity furnaces when converting to blower operation. You can find in these articles the type of furnace you are going to baffle and follow the drawings. Please note the many variations developed by contractors and note the different methods designed for particular types of furnaces.

Also in the Furblo Bulletins (first series) G. A. Voorhees discussed this problem at some length (Bulletin 11), showed sketches of baffles, gave formulas for determining suitable velocities and air passage areas. You probably can obtain a copy of this bulletin by writing the Furblo Company, Hermansville, Mich.

## Liquid Resin Flux

**American Artisan:**

On page 57 of the April issue, in the article "Soldering Flat Seam Metal Roofs" the author states in the last paragraph on this page ". . . Resin requires more labor, but is a highly satisfactory flux producing as strong a soldered joint as zinc chloride. It is somewhat difficult to use on windy days and on steep inclines owing to the powder sliding or blowing away. . . ."

If readers want to use resin they should know that if the powdered resin is dissolved in naphtha you can paint the solution on with a brush and thus have no trouble in keeping the resin in place.

C. L. EPPS, Ohio.

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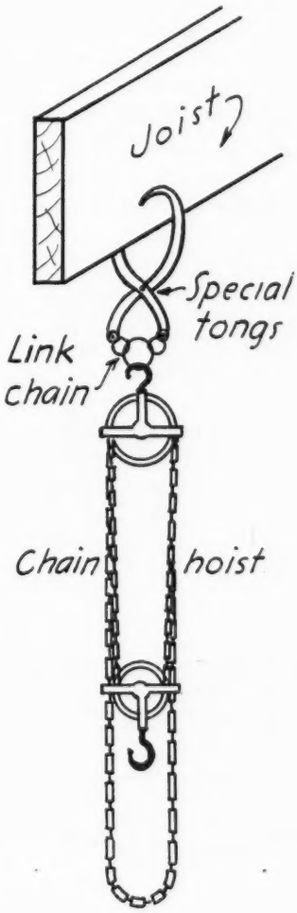
## Another Radiator Hoist

**American Artisan:**

I notice in the Problem Corner for April a suggestion for a tong hanger for block and tackle used to hoist radiator sections. The sketch shows a variation of this idea which I have used successfully for sixteen years. The joist tongs were made special by our local blacksmith of tempered




steel. In place of the block and tackle, I use a ¼-ton chain hoist. It holds at any level. In place of the 4 by 4 block and eye bolt, I use a small link (twisted) chain which enables me to get a hold at any point on the piece to be lifted. The three links in the tong chain prevent any springing and once the tong points set, the more weight is added the deeper the tong points enter the joist.

If possible I set the hoist to one side of the radiator, raise that side by 2 inches; then move to the other side and repeat; then swing clear and lower to the floor. I have handled castings weighing up to 600 pounds with ease.

KARL HABERECHT, Ohio

## Repairing Old Roof

**American Artisan:**

**We have a very flat roof of about 4,000 square feet to renew. This is a tin roof, lead painted, later patched with plastic. During a storm a large area was torn off and a good roof is wanted.**

**1—Would you advise putting on a new tin roof? What weight of tin?**

**2—Is there any company making galvanized iron roofing with seams on all four sides so the material can be applied like a tin roof?**

**3—Would galvanized iron be better than tin, if we cut and seamed the sheets ourselves?**

**4—Should the new roof be laid over the old tin, or should the old roof be taken off?**

**5—Would you recommend a built-up roof over the tin?**

**6—Is asphalt or pitch best?**

**7—Do you recommend a hot mopped finish or a heavy coat with gravel imbedded?**

**We have had trouble with asphalt cracking in winter.**

**E. V. Z., Iowa.**

—

**Reply by**
**H. A. Daniel, Atlas Roofing Co., Newburgh, N. Y.**
**W. J. Schmitt, Flesch & Schmitt, Rochester, N. Y.**

At the recent convention of the New York Sheet Metal Contractors in Albany, your question regarding the flat roof was presented to two well known roofing contractors and their opinions answering your question are as follows:

1—A new tin roof is not advisable unless the owner is willing to stand the expense of removing all of the old tin and providing a new sheathing and laying the tin flat locked and soldered. "Standard Practice in Sheet Metal Work" recommends wood sheathing and building paper under the tin: 14x20" sheets and any weight which will meet the specifications.

2—So far as we know, there is no manufacturer making galvanized roofing with seams on four sides. This construction is not recommended and tin is preferred over galvanized iron for flat-locked and soldered roofs.

3—Galvanized iron is no better than tin, because the galvanizing will crack under the strain of expansion and contraction and application is much more difficult than with tin.

4—If the present roof is flat-locked tin and in fair condition, you can apply the new roof (built-up) directly over the tin.

5—Answered by question 4, above.

6—You can take your choice of pitch or tar—both materials having strong advocates, and whichever material you have had most satisfactory experience with is probably the material to use.

7—Either hot mopped finish or heavy coating with gravel or slag is perfectly OK and you can take your choice.

In answer to your last comment, covering cracking in asphalt, the pitch advocates tell us that pitch is not so apt to crack as the asphalt, and the asphalt advocates say just the reverse, so you probably will never find the answer to this and should be guided by your own experience.

*Says Mr. Daniel on receiving a copy of these answers: "There is just one correction which I wish to make in regard to Item 7 and that is that if coal tar pitch is used it should be coated on top with gravel, slag or crushed stone.*

*"In this I am sure that Bill Schmitt will agree with me. Where he may not agree is that if the asphalt roof is used it will not be necessary to cover it with slag, gravel or crushed stone. He thinks it should be, and I think this is unnecessary, because asphalt, especially if the Trinidad Lake natural asphalt is used, will not need slag or gravel because of the greater resistance which the Trinidad Lake natural asphalt has against disintegration by the light rays.*

*"Years ago roll roofing was made of coal tar saturated felts. These roll roofings, saturated with coal tar pitch, did not prove satisfactory and were superseded by roll roofing saturated with asphalt and coated with asphalt. Sometimes this had gravel or crushed slate but lots of time the felt was bare. Such felt proved satisfactory for a great deal longer period than the old coal tar saturated roofings lasted."*

# "You Can't Go Broke"

## *If you will keep adequate and intelligent cost records, says L. L. Dees, Kansas Contractor*

By Dwight Abbott

THE sheet metal shop operator whose records do what records are supposed to do—keep him in constant touch with every phase of his business—can't go broke! He will know, soon enough, when to make the moves that will change the business picture for his firm—or when to close shop and go fishing.

This is the philosophy which, Leonard L. Dees of Topeka, Kansas believes, has given his firm, the Kansas Sheet Metal Co., doing specialty fabrication, air conditioning work and a general sheet metal business, a sound basis for watching profits.

Having studied carefully the problems an operator meets during the growth of his firm from a small tin shop to an important operating unit and having been called upon to pass on some of this experience to others, Mr. Dees has profited well, he believes, through building up a system of books and records that gives him instant insight into every factor of cost and selling.

"If any shop will maintain the proper records, there is no reason in the world why it should remain in business long enough to go broke," the Kansan points out. "Studying my books is like looking at a picture of my business from day to day and what it may be like a few months from now."

Simple records are kept by the Kansas Sheet Metal Co.; records based on the picture represented by the question, "The services of how many men do you have to resell, in order to meet overhead and pay a profit?"

Mr. Dees explains this by the following concrete example: Assume that you are paying a man $6 or $7 a day. Social security, etc., jumps this to $8 a day. Assume that you can sell this man's services for only $10 a day, or at a gross profit, above his labor cost, of $2. He is working about 300 days a year, with some time out for sickness, perhaps; he therefore brings a gross profit, on labor, of about $600.

### Selling Mechanic's Labor

Assume that this mechanic is using $3 to $5 (selling price) of material each day, of which about 25 per cent is gross profit. On a working year of 300 days, $4 a day of material means $1,200 gross sale of material a year. Material, then, per man per year brings about $300. Gross profit per worker employed, then ($600, labor plus $300, material), runs about $900. But assume you have an overhead of about $4,000, and you pay yourself (salary) about $2,500, or a total of $6,500.

How many men do you have to employ and keep busy to meet the bill?—In this case, about seven.

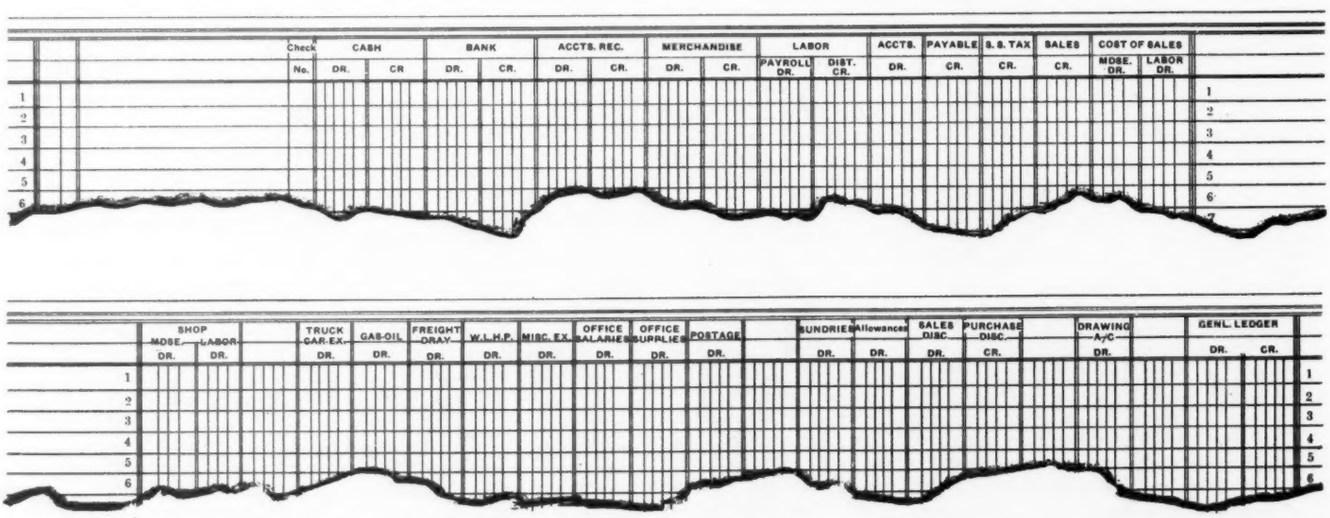



**Fig. 1—The 26 column headings of the double entry journal which is the foundation of the simple bookkeeping system discussed in this article. Journal sheets, without headings, are purchased and the headings are filled in by the contractor with a rubber stamp.**

Job. No. (Cost card) Inv. No.

, 193

Owner

Address

Work Done

| Cost | Quan. | | | Unit Price | Sell |
|---|---|---|---|---|---|
| | | Hrs. | Labor | | |
| | | Hrs. | Labor | | |
| | | Lbs. | Galvanized Iron | | |
| | | Lbs. | Black Iron | | |
| | | Lbs. | Copper | | |
| | | Lbs. | Solder | | |
| | | | Welding | | |
| | | | Welding | | |
| | | | Materials | | |
| | | | Tax | | |
| | | | Labor | | |
| | | | TOTAL | | |

Job No. Time card) Inv. No.

**KANSAS SHEET METAL CO.**

193

Workman

Owner

Address

Work Done

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| | To | A. M. | To | P. M. | |
| | To | A. M. | To | P. M. | |
| In | MATERIALS | | | Total Hours | |
| Out | | | | | |

**Fig. 3—(Left)—The Cost Card used is printed on white cardboard and on the back is the Time Card shown above (Fig. 4). Thus the time worked is entered by the workmen on one side and the amount of material and the recap of labor from the Time Card are entered on the other side. This gives a complete record of the job.**

"It isn't what you pay the man that you must think about first," Mr. Dees explains. "It's what can you resell his services for. The shop owner is only an agent, or coordinator, extracting a fee for his services in selling the work of the men in his shop to others. Many dealers lose out in business because they don't make this approach to their sales problem."

"Also closely tied in with this problem," Mr. Dees continues, "is the fact that emloyees should look on their emloyer not as the boss, not as a slave driver, but as the person who must coordinate their efforts toward the completion of a service to the consumer, and the employee should be mindful that he also shares in this transaction."

Mr. Dees' records were built rather haphazardly at the start, but the records have been reworked into a system with the aid of a bookkeeping specialist, beginning a little more than three years ago.

The records used consist of:

1. **Double Entry Journal**—Indispensable in modern bookkeeping. The journal is kept under 26 headings, stamped in with a rubber stamp at top of each column across the double page. This eliminates special sheets and uses pages found in practically every office supplies store. The headings are Check #, cash (Dr. and Cr.), etc. A typical journal

KANSAS SHEET METAL COMPANY, TOPEKA, KANSAS

| Date | Name | Invoice Number | Sales | Cost of Material | Cost of Labor | Gross Profit | Taxable Material | Non-Tax Labor | Exempt Resale, Church Charity | Exempt Governmental Agencies | State Tax |
|---|---|---|---|---|---|---|---|---|---|---|---|
| May 18 | J. A. Green | 12161 | $ 3.25 | $ 0.51 | $ 1.81 | $ 0.93 | ..... | ..... | ..... | ..... | ..... |
| May 18 | Wm. Baer | 12178 | 4.35 | .18 | 1.63 | 2.54 | ..... | ..... | ..... | $ 3.25 | ..... |
| May 23 | Bowers & Co. | 12200 | 245.00 | 88.70 | 78.14 | 78.16 | ..... | ..... | $4.35 | ..... | ..... |
| May 29 | Murrell | 12226 | 17.54 | 6.57 | 2.94 | 8.03 | $9.86 | $7.48 | ..... | 245.00 | $0.20 |
| | | | $270.14 | $95.96 | $84.52 | $89.66 | $9.86 | $7.48 | $4.35 | $248.25 | $0.20 |

**Fig. 2—Typical page of the Sales Journal. Each job is entered under the headings shown. These entries give a quick survey of any one or a monthly group of jobs. From this ledger net profit can be figured quickly.**

KANSAS SHEET METAL & ROOFING CO.

Topeka, Kansas

## OPERATING STATEMENT

| | April, 1939 | | Jan. 1st to April 30th | |
|---|---|---|---|---|
| *Sales*: | | $4,000.00 | | $12,000.00 |
| Cost of Sales: | | | | |
| Merchandise | $1,200.00 | | ..... | |
| Labor | 1,800.00 | | ..... | |
| | | $3,000.00 | | ..... |
| GROSS PROFIT | | $1,000.00 | ..... | ..... |
| *Expenses*: | | | | |
| Rent | 90.00 | | $ 360.00 | |
| Shop Exp. (material) | 50.00 | | ..... | |
| Shop Exp. (labor) | 60.00 | | ..... | |
| Truck & Car Expense | 2.00 | | ..... | |
| Gas & Oil | 30.00 | | ..... | |
| Freight & Drainage | 5.00 | | ..... | |
| W. L. H. & Power | 15.00 | | ..... | |
| Miscellaneous | ..... | | ..... | |
| Blue Prints | ..... | | ..... | |
| Advertising | 10.00 | | ..... | |
| Taxes | 60.00 | | ..... | |
| Insurance | 75.00 | | ..... | |
| Licenses | ..... | | ..... | |
| Sales Expense | 40.00 | | ..... | |
| Traveling Expense | 10.00 | | ..... | |
| Office Salaries | 90.00 | | ..... | |
| Office Supplies | 10.00 | | ..... | |
| Postage | 10.00 | | ..... | |
| Tel. & Tel. | 15.00 | | ..... | |
| | | ..... | | ..... |
| TRADING PROFIT | ..... | ..... | ..... | ..... |
| Other Expense: | | | | |
| Dues & Donations | ..... | | ..... | |
| Allowances on Sales | ..... | | ..... | |
| | | ..... | | ..... |
| Total | ..... | ..... | ..... | ..... |
| Other Income: | | | | |
| Discounts Earned | ..... | | ..... | |
| Net Deduction | ..... | | ..... | |
| | | ..... | | ..... |
| Net Gain | ..... | | ..... | |
| | | ..... | | ..... |

sheet is shown in Fig. 1.

2. **Sales Journal**—Something few small sheet metal shops have, and all would find good use for, Mr. Dees believes. Listings here are carried under the headings shown in Fig. 2.

Labor and material in this journal must balance with the amount of labor paid for, and the amount of material paid for, and inventory on the remainder shown in double entry ledger. "The value of this record is that it gives you immediately your gross profit," Mr. Dees explained. "It gives the complete history of any job, so that you can go down through the month on any given job and see what happened, and what was your gross profit from each job and the totals."

3. **Cost Journal**—Used only for major jobs. In this ledger are kept breakdowns of all jobs "whose cost we want to have at hand." From this journal we can check estimates against actual costs, to determine the degree of accuracy with which we made the estimate," Mr. Dees explains. Headings give necessary information for this purpose.

4. **Cost and Time Card**—For all jobs going through the shop—is a permanent record on all minor jobs, not listed in the cost journal. This is a four by seven inch file card, with the "cost" feature form on one side, the time cards form on the other.

a. The cost card is shown in Fig. 3. Costs and quantity are listed, with unit price and selling price, by hours of labor, and pounds of material—the latter being specified as galvanized iron, black iron, copper, solder; also welding cost. The invoice for the job is posted from this form; the form is filled in as each job is completed.

b. Time card shown in Fig. 4 has an "operation number" feature worth explanation:

Workman makes a check mark beside one of six numbers, one to six, to indicate which operation (layout, cutting, forming, soldering, painting, etc) he may have performed during the time marked. The check mark against the number tells the shop foreman at once what part of the job has been done by this man—he knows, of course, what operations were required with this job. Thus, it can be determined just how much time it took a workman to perform one of the operations indicated. (See card accompanying). This aids in determining the cost of a series of operations, and is used only when it is desirable that such costs be recorded.

5. **Purchase Record**—This shows what exactly went into merchandise. Merchandise is broken

(*Continued on page* 114)

KANSAS SHEET METAL & ROOFING CO.

Topeka, Kansas

## BALANCE SHEET

April 30, 1939

| | | |
|---|---|---|
| Cash: | | |
| Cash in Office | $ 40.00 | |
| Cash in Bank | 3,500.00 | |
| Petty Cash Fund | 25.00 | |
| Cash Deposits | 200.00 | |
| | | $3,765.00 |
| Accounts Receivable | | 6,000.00 |
| Merchandise | | 6,600.00 |
| Labor Cost (unfinished work) | | 500.00 |
| Machinery & Equipment | | 1,500.00 |
| Trucks & Cars | | 1,100.00 |
| Furniture & Fixtures | | 200.00 |
| Total Assets | | ..... |
| LIABILITIES | | |
| Accounts Payable | | $700.00 |
| Social Security Tax: Payable | | 20.00 |
| Unemployment Tax: Payable | | 35.00 |
| Sales Tax: Payable | | 12.00 |
| Total Liabilities | | ..... |
| Net Worth (KSMCO) Jan. 1, 1939 | ..... | ..... |
| Profit: Jan. 1 to April 30, 1939 | ..... | ..... |
| Less Drawings: 1939 | ..... | ..... |
| Total Liabilities | | ..... |
| Net Worth | | ..... |

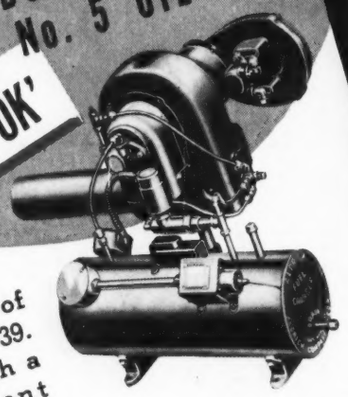
AMERICAN ARTISAN

# RESIDENTIAL AIR CONDITIONING

## SECTION

DEVOTED TO HOME AND SMALL COMMERCIAL AIR CONDITIONING

# ALDRICH 'Sav-Haf' ONLY GUN-TYPE DOMESTIC OIL BURNER FOR No. 5 OIL WITH UNDERWRITER'S 'OK'

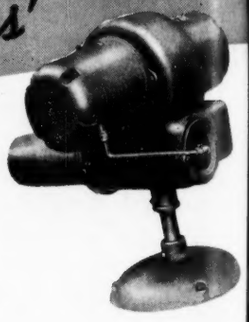


It's the sensation of the industry for 1939. Years ahead—with a vast replacement market awaiting it.

Burns No. 5 oil perfectly down to 1 GPH—doing it DAILY here and abroad. Pays for itself in fuel-savings. Can be installed for No. 2 or 3 oil, if needed, and easily converted when No. 5 oil is available.

ALDRI
PEOR

# Aldrich Oil Burners have HIGHEST EFFICIENCY. 'No Tin Lizzies'



Loyd Aldrich was designing oil burners before "CO-2" became a factor and he guarantees satisfied customers. Those years of experience go into every ALDRICH burner made today! "Higher Efficiency" has been his constant objective.

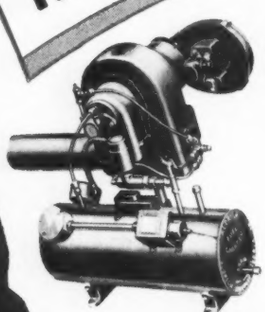
TODAY he says: "We build ALL Aldrich burners so they can't be adjusted to give less than 10% CO-2."

He uses no "tin"—only heavy castings correctly machined. No rusting. No rattles or rumbles while running!

ALDRICH COMPAN
PEORIA, ILLINO

# HEADLINES that tell why you should sell ALDRICH Oil Burners

# GREATEST SALES IN THE INDUSTRY



One out of every 9 or 10 burners installed is an Aldrich.

1939 has already witnessed the increased appreciation that ALDRICH burners enjoy. More and more Dealers and Distributors are clamoring for our contracts.

Our "Sav-Haf" has helped to convince men everywhere (here and abroad) that ALDRICH is the real line to tie to—the line with a REAL FUTURE!

Our past history PROVES it!

ALDRICH COMPANY
PEORIA, ILLINOIS

# WHY WAIT 'TIL NOV.?

FOR STANDARD SPECIFICATIONS

*They're Here Now!*

We make ALL ALDRICH burners TEN TIMES as accurately as the proposed standards permit! Our own tolerances are 1/10th those suggested! And our guarantee is broader than others: WE GUARANTEE TO SATISFY THE CUSTOMER!

It's the kind of a guarantee that gives both Dealer and Customer complete confidence—and our burners amply back you up!

ALDRICH COMPANY
PEORIA, ILLINOIS

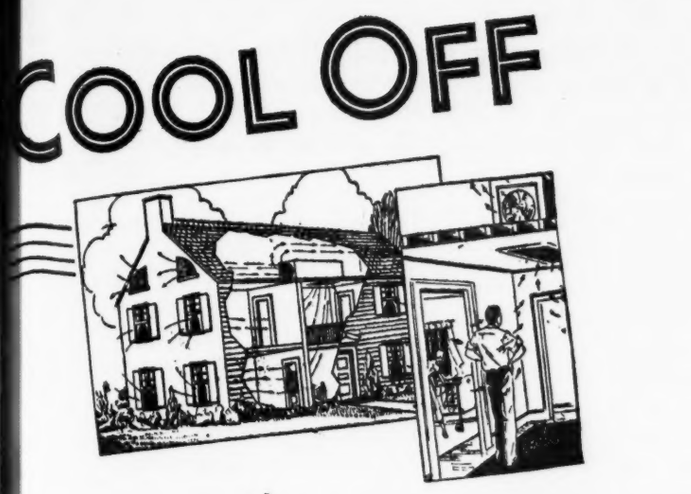
# ALDRICH COMPANY
PEORIA, ILLINOIS

ALDRICH COMPANY
PEORIA, ILLINOIS

RUSH us all dealer Details.
(Sign below or clip to your letterhead)

_____

_____


COOL OFF
with
COMFORT COOLING
BY VENTILATION
WHY spend sleepless, heat-tortured nights when you can make your home delightfully cool with Comfort Cooling by Ventilation? Heart of such a cooling system is a quiet Coolair fan, mounted out of sight in the attic. The fan blows-out super-heated attic air, draws-in cooler outside air through open windows in every room, and circulates a gentle, no-draft breeze. The result is healthful, refreshing coolness at the flick of a switch!
The cost? You can enjoy Comfort Cooling by Ventilation in your home for less than it costs to use an electric refrigerator, under the new lower electric rates! The installed system costs surprisingly little, too. Come by or phone today and let us tell you about the low cost of Comfort Cooling for your home!
Georgia Power Co.

# The 1939 Attic Ventilating Campaign of Georgia Power Co.

By Ray Warwick

THE first attic ventilation sales campaign of the Georgia Power Company has just been completed. The campaign ran from May 15 to July 31. Now that it is ended the merchandising division and advertising department know many practical things that they did not know before, points about the selling, advertising and merchandising of attic ventilation that can be learned only by experience. But one thing they know especially —and that is that attic ventilation has great marketing possibilities, particularly in the South.

By the campaign's end the Georgia Power Company had sold 150 domestic type fans and 75 commercial type units—a total of 225. This total, the advertising department estimates, should prove to be about 80 per cent of the total number of units sold during this season for, although the campaign period has closed, actual sales will continue well into September.

This first drive was, in a sense, a test campaign. Any drive by Georgia Power Company to sell a new line takes on the nature of an experiment, so this first campaign was carefully planned and executed under the direction of O. M. Jackson, sales promotion manager, and his assistant, W. B. Farnsworth. Under their guidance were all the salesmen in the eighty-five stores operated by the Georgia Power Company in Georgia.

### General Problems

The power company retails in its eighty-five stores electrical appliances of all kinds. With the sales force selling all appliances, it was not advisable to appoint a special cordon of salesmen to the exclusive selling of attic ventilation. Besides, it would have been bad psychology. Most of the salesmen knew very little about attic ventilation; they did not believe firmly in it. At the outset, they were inclined to stick to their familiar, well-established appliances, such as refrigerators and electric ranges.

These were the problems facing the campaign directors: they had first to sell the salesmen on attic ventilation; they had to arrange a compensation system that would make it worth while for the salesmen to give their time to it; and they had to back it all up with merchandising and advertising that would help them to make sales.

A campaign of two-and-a-half months, May 15th to July 31st, was mapped; during this time the salesmen were to receive special bonuses for attic ventilation sales, a special compensation that made it really worth the effort. Indeed, some of the salesmen discovered that they could earn more money

selling attic ventilation than they could on their old stand-by appliances. But at first they had to be sold on the idea; and the campaign planners did sell them on it completely.

At the beginning of the campaign sales meetings were conducted in all of the power company's division offices throughout the state, to announce the start of the drive, to introduce the salesmen to attic ventilation, to sell them on the idea and to explain the details of the campaign plans and the special compensation set-up.

### Salesman's Manual

As preparation and backing for this, the advertising department compiled a 35-page salesman's manual, "Comfort Cooling by Ventilation," in which everything the salesman needed to know about attic ventilation was explained in detail—including principles of operation, applications, installations. The manual was illustrated with drawings and diagrams graphically explaining how attic ventilation works and showing typical installations, special installations, with thorough data on technical details.

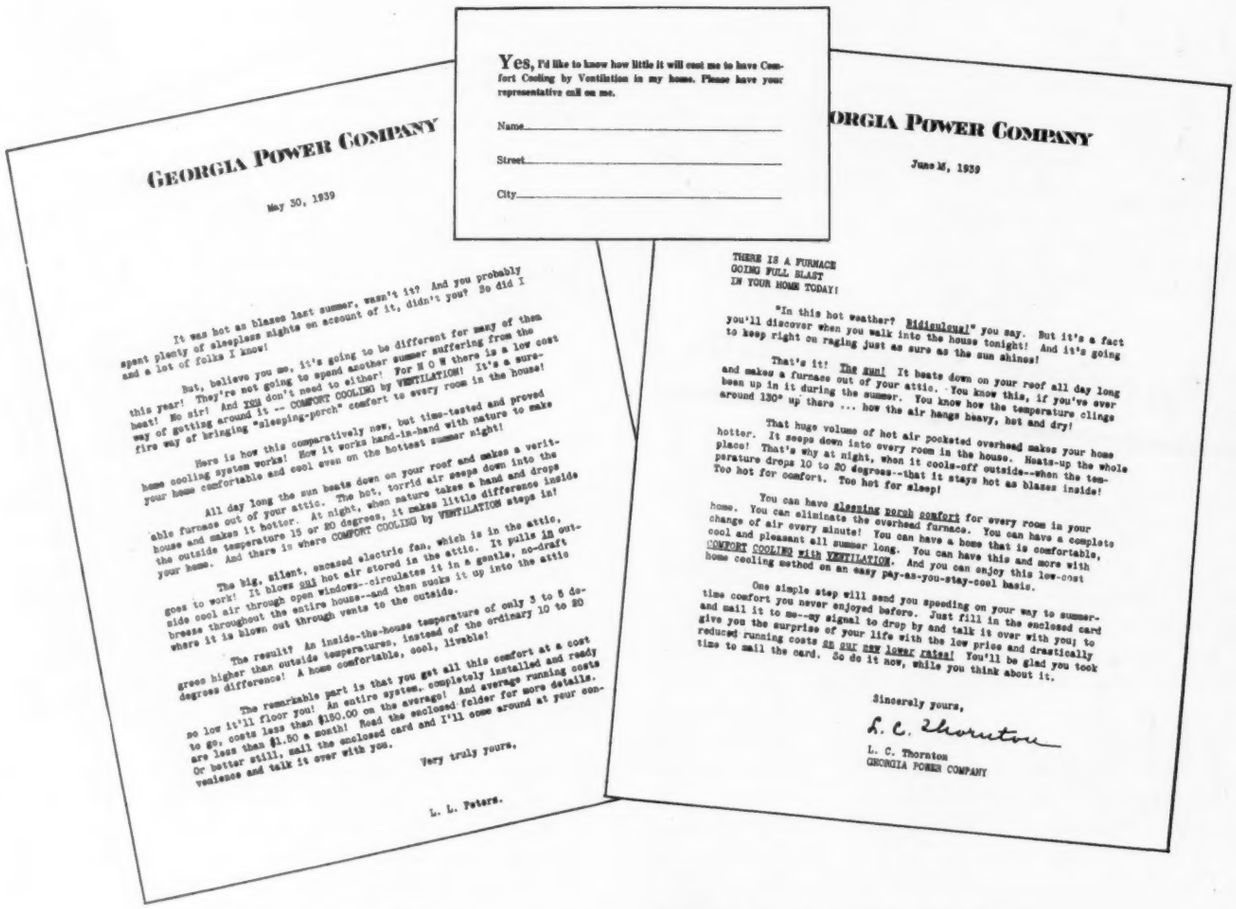
The chief target of the campaign was a select list of 2,500 names sifted from the rolls of Georgia home-owners.

Advertising copy consisted of three direct-by-mail pieces and one newspaper advertisement. The appropriation for this first campaign was small, which explains the small amount of newspaper space used.

### The Direct Mail Program

The direct-by-mail pieces were made up of broadsides, furnished by the manufacturer whose unit the Georgia Power Company sells, plus letters and business reply cards prepared by the company's own advertising department. The first mail piece was a broadside with a business reply card; the second was another broadside and business reply card, accompanied by a letter signed by the salesman who submitted the prospect in his territory; the third was another letter, signed as before, and a business reply card.

The total number of business reply cards that were returned to the Atlanta headquarters from all over the state was fifty-eight. This may seem, at first glance, a low return; but the explanation is that the business reply cards were aimed at the more remote prospects, homes that were not near any of the company's stores. It was assumed that those prospects near the stores—and they cover



GEORGIA POWER COMPANY

May 30, 1939

It was hot as blazes last summer, wasn't it? And you probably spent plenty of sleepless nights on account of it, didn't you? So did I and a lot of folks I know!

But, believe you me, it's going to be different for many of them this year! They're not going to spend another summer suffering from the heat! No sir! And YOU don't need to either! For H O W there is a low cost way of getting around it -- COMFORT COOLING by VENTILATION! It's a sure-fire way of bringing "sleeping-porch" comfort to every room in the house!

Here is how this comparatively new, but time-tested and proved home cooling system works! How it works hand-in-hand with nature to make your home comfortable and cool even on the hottest summer night!

All day long the sun beats down on your roof and makes a veritable furnace out of your attic. The hot, torrid air seeps down into the house and makes it hotter. At night, when nature takes a hand and drops the outside temperature 15 or 20 degrees, it makes little difference inside your home. And there is where COMFORT COOLING by VENTILATION steps in!

The big, silent, enclosed electric fan, which is in the attic, goes to work! It blows OUT hot air stored in the attic. It pulls in outside cool air through open windows--circulates it in a gentle, no-draft breeze throughout the entire house--and then sucks it up into the attic where it is blown out through vents to the outside.

The result? An inside-the-house temperature of only 5 to 8 degrees higher than outside temperatures, instead of the ordinary 10 to 20 degrees difference! A home comfortable, cool, livable!

The remarkable part is that you get all this comfort at a cost so low it'll floor you! An entire system, completely installed and ready to go, costs less than $150.00 on the average! And average running costs are less than $1.50 a month! Read the enclosed folder for more details. Or better still, mail the enclosed card and I'll come around at your convenience and talk it over with you.

Very truly yours,

L. L. Peters.

**Yes,** I'd like to know how little it will cost me to have Comfort Cooling by Ventilation in my home. Please have your representative call on me.

Name_____

Street_____

City_____

ORGIA POWER COMPANY

June M, 1939

THERE IS A FURNACE
GOING FULL BLAST
IN YOUR HOME TODAY!

"In this hot weather? Ridiculous!" you say. But it's a fact you'll discover when you walk into the house tonight! And it's going to keep right on raging just as sure as the sun shines!

That's it! The sun! It beats down on your roof all day long and makes a furnace out of your attic. You know this, if you've ever been up in it during the summer. You know how the temperature clings around 130° up there ... how the air hangs heavy, hot and dry!

That huge volume of hot air pocketed overhead makes your home hotter. It seeps down into every room in the house. Heats-up the whole place! That's why at night, when it cools-off outside--when the temperature drops 10 to 20 degrees--that it stays hot as blazes inside! Too hot for comfort. Too hot for sleep!

You can have sleeping porch comfort for every room in your home. You can eliminate the overhead furnace. You can have a complete change of air every minute! You can have a home that is comfortable, cool and pleasant all summer long. You can have this and more with COMFORT COOLING with VENTILATION. And you can enjoy this low-cost home cooling method on an easy pay-as-you-stay-cool basis.

One simple step will send you speeding on your way to summer-time comfort you never enjoyed before. Just fill in the enclosed card and mail it to me--my signal to drop by and talk it over with you; to give you the surprise of your life with the low price and drastically reduced running costs on our new lower rates! You'll be glad you took time to mail the card. So do it now, while you think about it.

Sincerely yours,

L. C. Thornton

L. C. Thornton
GEORGIA POWER COMPANY

**On facing page—The newspaper advertisement. This newspaper advertisement in some papers also featured desk fans. Above—First and third letters to prospects mailed with advertising folders to 2,500 electric users. These letters were depended upon for contact with prospects remote from company stores.**

**Outside cover and typical chapter title pages from the 35-page attic ventilating manual prepared to explain this cooling method to the sales force. Numerous drawings and installation details were included.**

the state pretty thoroughly—would call in for further information rather than reply by the card.

In all the advertising copy the advertising department rejected, logically, the somewhat misleading use of the term, "attic ventilation," in favor of the appealing phrase, "Comfort Cooling by Ventilation," sometimes using the phrase, "Breeze-Conditioned." Because, as H. C. Coffey of the advertising department said, "Nobody cares anything about ventilating the attic."

Added to all these methods of attack—direct-by-mail, newspaper display advertising, house-to-house selling—was a clever exhibit of a little model house in each of the company's six division offices. Through a glass wall and roof the house showed the ventilation unit in operation in the attic and its effect on air circulation in the rooms, revealed by small curtains in the windows that were blown by the air currents.

Besides serving to demonstrate the principles of attic ventilation to prospects, these little models apparently helped a great deal to convince the salesmen themselves of attic ventilation's values. For one of the floor salesmen in the Atlanta store, while he was demonstrating the operation, pointed proudly at the little house and said:

"The swell thing about it is, it really works! I didn't believe in it at first."

Now that this test campaign is ended, the advertising and merchandising departments have added practical experience in selling attic ventilation to theory.

Perhaps the most important results of this first campaign are the things the company has learned about attic ventilation. The company and its sales force have been convinced that attic ventilation has tremendous market possibilities. They have found, too, that attic ventilation is highly satisfactory to its users; for every customer has been greatly pleased with the results and the company has received not one single complaint. The most popular models, judging by recent sales, sold at from $107.00 to $141.00; installation charges ranged from $15.00 to $35.00, the average being somewhere between $20.00 and $25.00.

The organizers and leaders of this first drive are looking forward to next year's campaign. "We're going to do a lot with it," said Mr. Farnsworth. They feel that in the South, especially, attic ventilation has tremendous possibilities. For in the South, at least in Georgia, there are about six months in which attic ventilation can be used to advantage.

# A Technical Code, Heating and Cooling Installation, Zoned Horizontally

AT THE 1939 Michigan State College Short Course in warm air heating, the advanced students studied and figured a plan for a combination winter air conditioning and summer cooling system in a large residence of the extended ground plan type, modern in materials used and construction—in short the type of large house in which warm air air conditioning is finding ready acceptance.

This plan studied was not a theoretical layout, but an actual residence in Peoria, Illinois, completed long enough before the school was held for the engineers to study results and thoroughly satisfy the owner, Mr. Harley O. Potter. The architect of the house was Carter E. Hewitt.

The installation was designed by the Engineering Dept. of the Meyer Furnace Company and installed by the Heating and Sheet Metal Division (contracting) of the same concern. The engineering design is based strictly upon the Technical Code and with some exceptions, due to changes in owner's plans, was installed as shown. So that readers may study this system, we reproduce the four floor plans, the heat loss sheet for all the house except the basement, the duct layout calculations for all piping except zone 4 which serves the basement. The plans are unusually complete and annotated so that the reader can follow step-by-step the design procedure as outlined in the Technical Code. Because explanation of the design procedure would be tedious and require several issues we will omit such explanation and, instead, give the general specifications of the system.

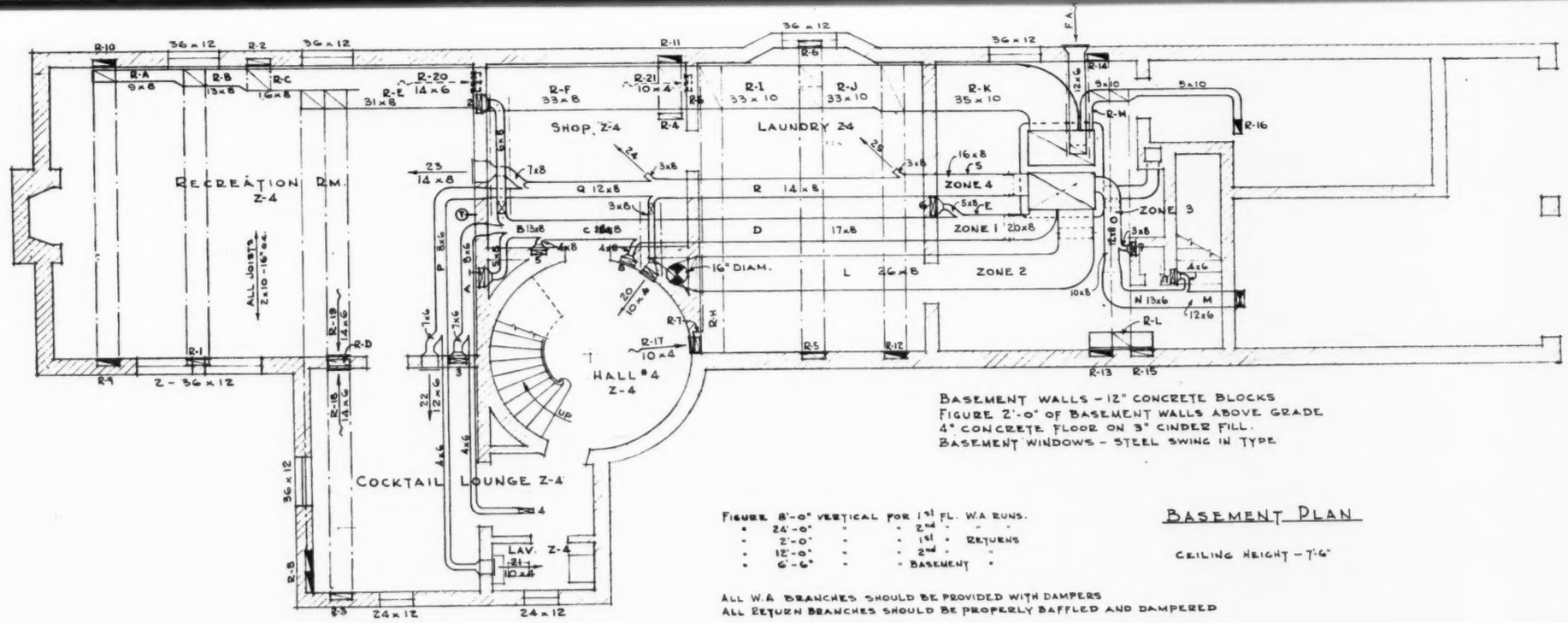
The winter air conditioning unit is a special stoker-fired steel furnace to which is attached a bin-feed stoker. The location of the equipment room, the runs of pipe through the basement, the overhead supply for the second floor and stacks are shown on the plans.

The system is divided into four zones as indicated by the plans. Zone No. 1 takes care of the first floor with the exception of the kitchen. Zone No. 2 takes care of the second floor with the exception of the servants quarters. Zone No. 3 takes care of the kitchen and the servants quarters. Zone No. 4 takes care of the basement.

The controls on the job are designed for both heating and cooling. Each zone is controlled by a separate thermostat located as shown on the plans. The thermostat controls the damper to its particular zone and it also controls the operation of the stoker. When a thermostat calls for heat, the zone damper to that particular zone is opened and the stoker is turned on. When the zone is satisfied, the zone damper is closed, then, if no other zone is calling for heat at that time, the stoker is shut off.

Since there is likely to be a large amount of residual heat stored in a stoker-fired unit after prolonged stoker operation, one of the zones, No. 4, is a relief zone. In case of excessive bonnet temperatures, after all zones have been satisfied, a high limit switch in the warm air plenum chamber will open the damper to the relief zone and turn on the blower. The zone selected for the relief zone is the zone of least importance in which a slight over-run in temperature does not matter. However, it has been found in practice that the relief zone seldom is required to function.

Zone No. 2 which includes the second floor is supplied from over-head. A single stack is run to



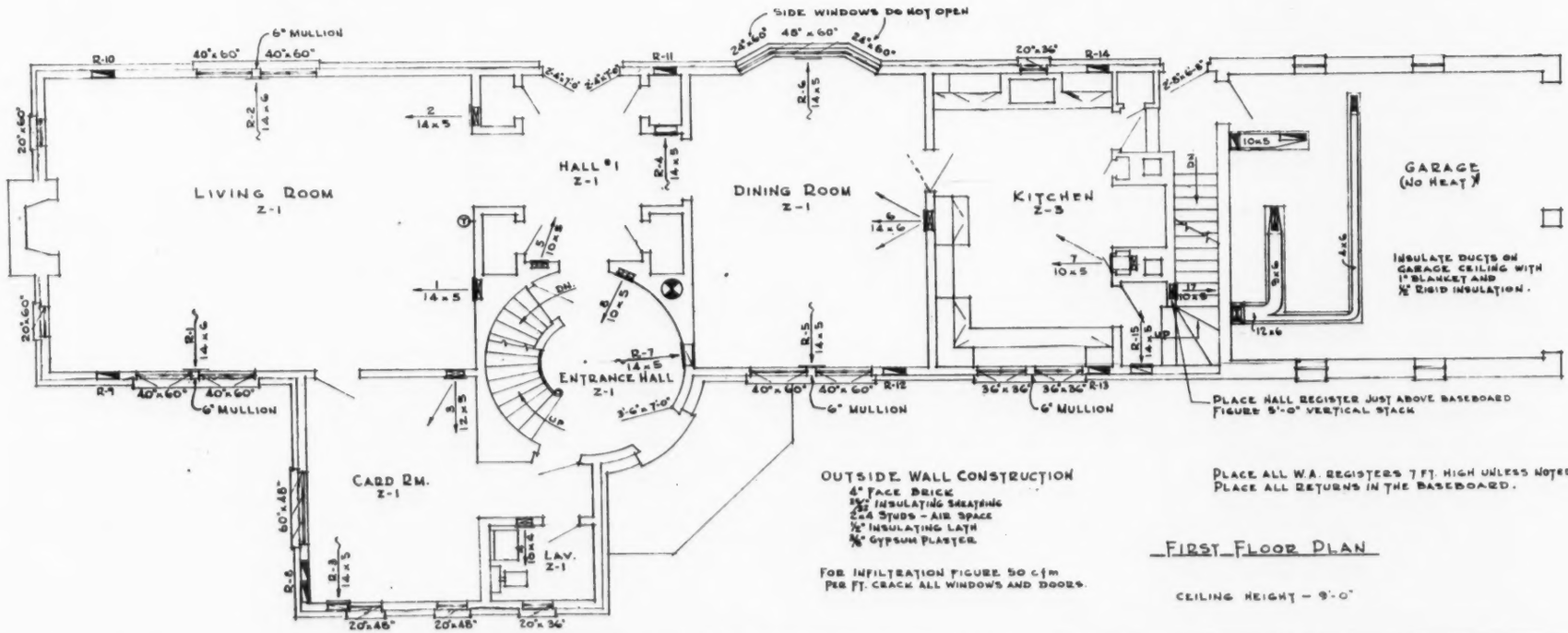

BASEMENT WALLS - 12" CONCRETE BLOCKS
FIGURE 2'-0" OF BASEMENT WALLS ABOVE GRADE
4" CONCRETE FLOOR ON 3" CINDER FILL.
BASEMENT WINDOWS - STEEL SWING IN TYPE

| | | | |
|---|---|---|---|
| FIGURE | 8'-0" | VERTICAL FOR | 1st FL. W.A RUNS. |
| " | 24'-0" | " | 2nd " " |
| " | 2'-0" | " | 1st " RETURNS |
| " | 12'-0" | " | 2nd " " |
| " | 6'-6" | " | BASEMENT " |

ALL W.A BRANCHES SHOULD BE PROVIDED WITH DAMPERS
ALL RETURN BRANCHES SHOULD BE PROPERLY BAFFLED AND DAMPERED

## BASEMENT PLAN

CEILING HEIGHT - 7'-6"


LIVING ROOM Z-1
HALL #1 Z-1
DINING ROOM Z-1
KITCHEN Z-3
GARAGE (No Heat)
ENTRANCE HALL Z-1
CARD RM. Z-1
LAV. Z-1
SIDE WINDOWS DO NOT OPEN
6" MULLION
INSULATE DUCTS ON GARAGE CEILING WITH 1" BLANKET AND ½" RIGID INSULATION.
PLACE HALL REGISTER JUST ABOVE BASEBOARD FIGURE 5'-0" VERTICAL STACK

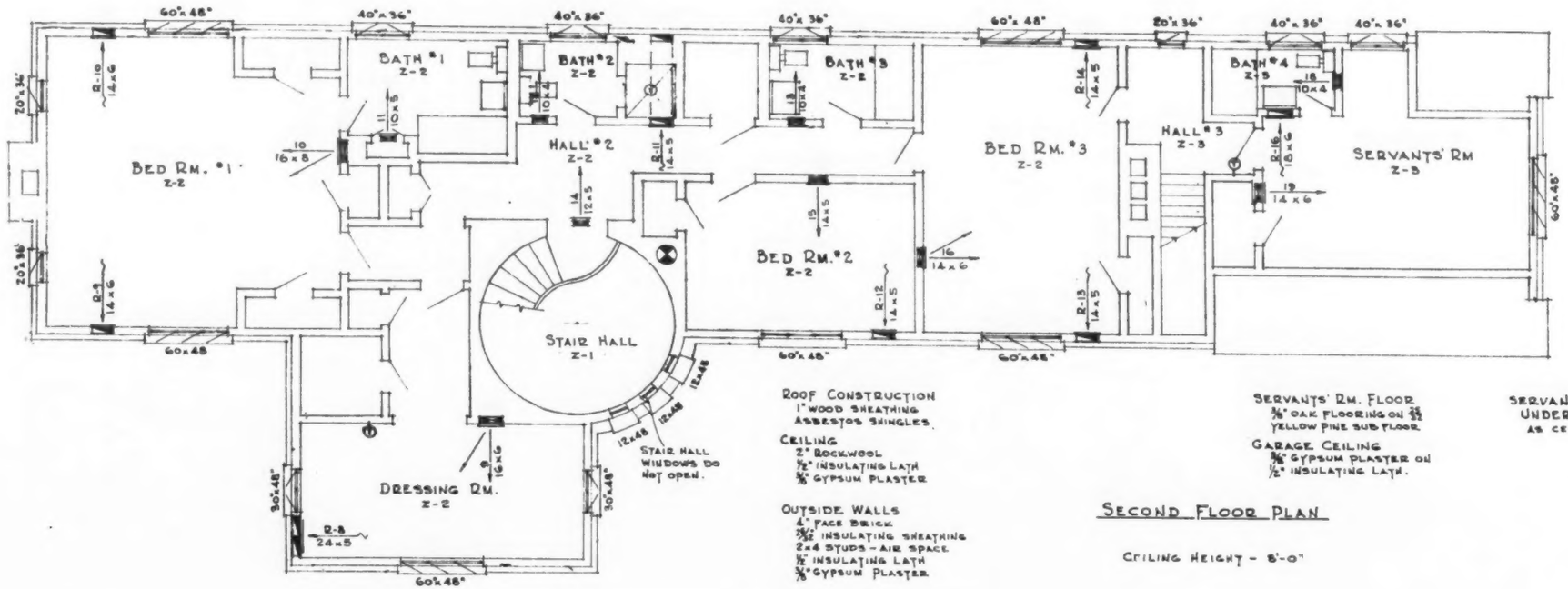
OUTSIDE WALL CONSTRUCTION
4" FACE BRICK
25/32" INSULATING SHEATHING
2x4 STUDS - AIR SPACE
½" INSULATING LATH
½" GYPSUM PLASTER

FOR INFILTRATION FIGURE 50 c/m PER FT. CRACK ALL WINDOWS AND DOORS.

PLACE ALL W.A. REGISTERS 7 FT. HIGH UNLESS NOTED OTHERWISE.
PLACE ALL RETURNS IN THE BASEBOARD.

## FIRST FLOOR PLAN

CEILING HEIGHT - 9'-0"




ROOF CONSTRUCTION
1" WOOD SHEATHING
ASBESTOS SHINGLES.

CEILING
2" ROCKWOOL
½" INSULATING LATH
⅜" GYPSUM PLASTER

OUTSIDE WALLS
4" FACE BRICK
25/32" INSULATING SHEATHING
2×4 STUDS - AIR SPACE
½" INSULATING LATH
⅜" GYPSUM PLASTER

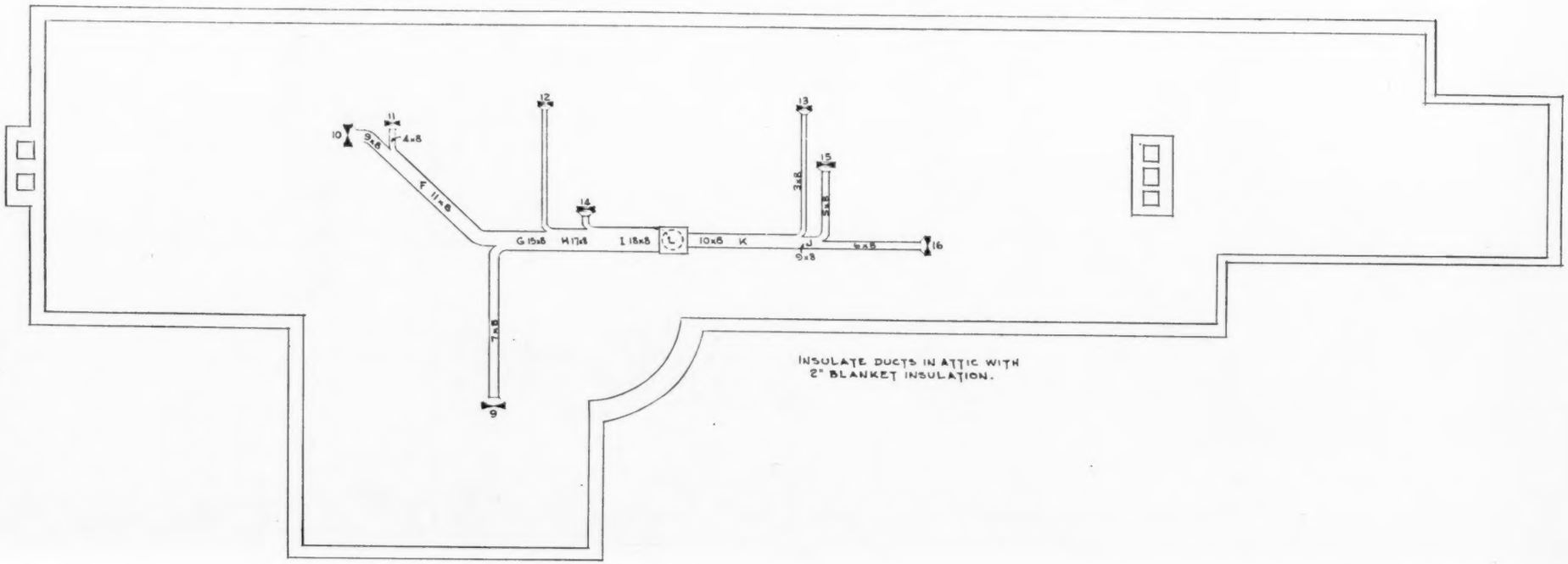
SERVANTS' RM. FLOOR
⅜" OAK FLOORING ON 25/32 YELLOW PINE SUB FLOOR

GARAGE CEILING
⅜" GYPSUM PLASTER ON ½" INSULATING LATH.

SERVANTS' RM WALLS UNDER ROOF - SAME AS CEILING.

## SECOND FLOOR PLAN

CEILING HEIGHT - 8'-0"




| | | | | | |
|---|---|---|---|---|---|
| UNIT SIZE | | | | OUTSIDE TEMPERATURE T = -10° | OWNER Harley O. Keller — PLAN NO. 73908 |
| TOTAL B.T.U. 244,470 | | TOTAL C.F.M. 2081 | | ATTIC TEMPERATURE T = +3 | ADDRESS Bellevillar Park — SHEET NO. 3 |
| HEAT LOSS | OUTSIDE WALL $U_B$ = .15 | CEILING $U_C$ = .10 | | BASEMENT WALL ABOVE GRADE $U_B$ = | ARCHITECT Carter & Harris — DATE |
| COEFFICIENT U | GLASS $U_B$ = 1.28 | ROOF $U_R$ = | | BASEMENT WALL BELOW GRADE $U_B$ = | PLAN NO. — DATE — REVISED |

the attic, and an attic trunk line distributes the air to the various outlets, which are all located seven feet above the floor in the side walls. In this manner a great many stacks through the first floor are avoided, and it also does away with a large amount of ductwork in the basement. Of course, it is necessary to insulate the ductwork in the attic rather heavily, and in this case it was done with 2-inch of Balsam Wool. The plans show the round riser through the stair hall wall.

For summer air conditioning a cooling unit consisting of a 3 horsepower compressor and direct expansion coil to match was installed. With the zoned arrangement of the ductwork, it is possible to obtain almost any degree of cooling desired in any part of the house. In extremely hot weather the cooling can be concentrated in one or two zones in order to obtain a greater degree of temperature difference between the inside and outside, while under less severe conditions, it can be distributed to the entire house. In this manner, a very flexible system is obtained.

(Continued on page 114)

UNIT SIZE — TOTAL B.T.U. 244,470 — TOTAL C.F.M. 2051

HEAT LOSS COEFFICIENT U PER DEGREE PER HOUR — OUTSIDE WALL $U_o$ = .16 — GLASS $U_g$ = 1.13 — INSIDE PARTITION $U_{ip}$ = — INFILTRATION = .018 — CEILING $U_c$ = .10 — ROOF $U_R$ = — FLOOR $U_f$ = .20

OUTSIDE TEMPERATURE T = -10° — ATTIC TEMPERATURE T = +1 — BASEMENT WALL ABOVE GRADE $U_b$ = — BASEMENT WALL BELOW GRADE $U_b$ = — BASEMENT FLOOR $U_f$ = — MEAN TEMP. GROUND BELOW GRADE =

OWNER — ADDRESS — DEALER — ADDRESS — ARCHITECT — PLAN NO. — DATE — REVISED — DRAWN BY — CHECKED BY

| ROOM USE OR ROOM NUMBER | Living | Card | Lav. | Hall #1 | Din | Kitchen | Entrance Stair/Hall | Dressing | Bed. #1 | Bath #1 | Bath #2 | Bath #3 | Hall #2 | Bed #2 | Bed. #3 | Hall #3 | Bath #4 | Servants | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ROOM TEMPERATURE | 72 | 72 | 72 | 72 | 72 | 72 | 72 | 72 | 72 | 80 | 80 | 80 | 72 | 72 | 72 | 72 | 80 | 72 | |
| ROOM SIZE & HEIGHT (NOMINAL) | 15'6"x10'6"x9 | 10'5"x14'5"x8 | 6'5"x9'x9 | 12'x10'6"x9 | 9'10"x10'6"x9 | 10'6"x10'6"x9 | 11'10" x 10' Diam. | 8'7"x7'am | 11'0"x10'6"x8 | 8'6"x7'8"x8 | 6'4"x10'6"x8 | 8'5"x10'6"x8 | 4'5"x7'8 | 13'5"x9'6"x8 | 11'0"x10'6"x8 | 4'x10'6"x8 | 7'4"x6'8"x8 | 16'3"x9'6"x8 | |
| CUBIC CONTENTS | 4246 | 1516 | 265 | 1380 | 2365 | 1856 | 1982 | 1760 | 2624 | 580 | 568 | 856 | 1560 | 1180 | 1815 | 800 | 532 | 1580 | 26051 |
| GROSS SQ. FT. OUTSIDE WALL | 587 | 245 | 98 | 208 | 250 | 189 | 135 | 312 | 408 | 78 | 74 | 90 | 96 | 106 | 204 | 180 | 59 | 188 | |
| TOTAL SQ. FT. GLASS & DOORS 1.13 x 82 = 92.7 | 88 | 33 | 8 | 28.7 | 33 | 92.7 | 78 | 92.7 | 55 | 92.7 | 37 | 92.7 | 40 | 92.7 | 80 | 92.7 | 18 | 101.7 | |
| NET SQ. FT. OUTSIDE WALL .16 x 88 = 13.1 .16 x 90 = 14.4 | 439 | 212 | 90 | 180 | 175 | 174 | 164 | 58 | 278 | 206 | 64 | 64 | 80 | 56 | 124 | 145 | 41 | 90 | |
| SQ. FT. INSIDE WALL .10 x 70 = 7.0 | | | | | | | | | | | | | | | | | | 224 | |
| SQ. FT. BASEMENT WALL ABOVE GRADE | | | | | | | | | | | | | | | | | | | |
| SQ. FT. BASEMENT WALL BELOW GRADE | | | | | | | | | | | | | | | | | | | |
| SQ. FT. CEILING .10 x 74 = 7.4 .10 x 82 = 8.2 | | | | | | | 110 | 220 | 388 | 65 | 46 | 45 | 190 | 140 | 287 | 90 | 29 | 190 | |
| SQ. FT. ROOF | | | | | | | | | | | | | | | | | | | |
| SQ. FT. FLOOR .20 x 77 = 15.4 .20 x 65 = 13.0 | | | | | | | | | | | | | | | | 9 | 29 | 190 | |
| INFILTRATION .018 x 82 = 1.47 .018 x 90 = 1.62 CU. CM/FT. CRACK - WINDOWS & DOORS | 3335 | 1700 | 465 | 1517 | 2665 | 1800 | 1050 | 1900 | 3168 | 986 | 986 | 936 | — | 1900 | 1900 | 468 | 935 | 3700 | |
| EXPOSURE | 106 | | | | | | | 106 | 106 | | | | | | | | | 106 | |

CALCULATIONS FOR COEFFICIENT U — Outside Walls U = 1 / (1/6.0 + 4/9.2 + .782/.35 + 1/1.10 + .5/.55 + .375/3.3 + 1/1.65) = .16 ; Ceilings U = .10 ; Floor 1/1.65 = .379 + .5/3.3 + .782/.35 + 1/1.10 = 1.65 ; Walls-same as ceilings .782 + .379 + 1/1.10 = 1.26

CU. CONT. 5464 ÷ 60 = NO. AIR CHGS 9 = C.F.M. 2070 — C.F.M. 2070 x B.T.U. 132750 = Q .0144 — REG. TEMP. 138

LONGEST ACTUAL LENGTH 78 X 1/4 + REGISTER TEMP. 138 = BONNET TEMP. 146

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SQ. FT. GLASS & DOORS | 1.65 | 3.3 | 1.65 | 3.3 | 1.65 | 3.3 | 1.65 | 3.3 | 1.65 | 3.3 | 1.65 | 3.3 | 1.65 | 3.3 | 1.65 | 3.3 | 1.65 | 3.3 | 1.65 | 3.3 |
| | 2160 | 109 | 3060 | 460 | 3060 | 7040 | 2320 | 3430 | 3710 | 4630 | 1080 | 1080 | 1080 | — | 1890 | 3710 | 460 | 1080 | 2780 | |
| NET SQ. FT. OUTSIDE WALL | 5250 | 2773 | 1320 | 980 | 2280 | 2150 | 1980 | 3560 | 4640 | 930 | 980 | 860 | 4710 | 1130 | 2150 | 1900 | 710 | 1880 | | |
| " " " INSIDE " | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1570 | | |
| NET SQ. FT. BASEMENT WALL ABOVE GRADE | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| " " " " " BELOW " | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| " " " CEILING | — | — | — | — | — | — | 815 | 1670 | 2430 | 530 | 980 | 540 | 1880 | 1040 | 1880 | 980 | 240 | 1610 | | |
| NET SQ. FT. ROOF | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | | |
| " " " FLOOR | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 140 | 500 | 2980 | | |
| INFILTRATION | 4900 | 2800 | 690 | 2730 | 3910 | 2650 | 1540 | 2800 | 3180 | 1510 | 1510 | 1510 | — | 2800 | 2800 | 680 | 1510 | 2800 | | |
| NET B.T.U. LOSS | 18800 | 8335 | 2370 | 6170 | 13240 | 7120 | 7065 | 11700 | 14900 | 4010 | 3830 | 3730 | 9270 | 6580 | 10040 | 3700 | 3380 | 87460 | | |
| CORRECTION FOR EXPOSURE | 1880 | — | — | — | — | — | — | 1170 | 1490 | — | — | — | — | — | — | — | — | 1250 | | |
| TOTAL B.T.U. LOSS PER ROOM PER HOUR | 20680 | 8335 | 2370 | 6170 | 13240 | 7120 | 7065 | 12870 | 16390 | 4010 | 3830 | 3730 | 9270 | 6580 | 10040 | 3700 | 3380 | 13710 | 149,830 | |
| AVERAG C.F.M. REQD. " " " " | 398 | 160 | 54 | 90 | 191 | 103 | 102 | 185 | 236 | 58 | 55 | 54 | 86 | 94 | 144 | 53 | 58 | 198 | | |

DESIGN C.F.M. 2070 — DESIGN REG. TEMP. 138 — DESIGN STATIC S.A. .10 R.A. .10 — OWNER — PLAN NO.

## WARM AIR LAYOUT

| STACK NUMBER | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ROOM USE | Living | Living | Card | Lav. | Hall #1 | Dining | Entrance Stair Hall | Kitchen | Dressing | Bed #1 | Bath #1 | Bath #2 | Bath #3 | Hall #2 | Bed #2 | Bed #3 | Hall #3 | Bath #4 | Servants | | |
| B.T.U. | 10540 | 10540 | 8335 | 2370 | 6170 | 12840 | 7120 | 7065 | 16390 | 4010 | 3830 | 3730 | 9270 | 6580 | 10040 | 3700 | 3380 | 13710 | | | |
| ACTUAL LENGTH | 48 | 50 | 52 | 46 | 40 | 16 | 14 | 35 | 72 | 74 | 68 | 68 | 58 | 64 | 67 | 20 | 34 | 41 | | | |
| EQUIVALENT LENGTH | 100 | 118 | 107 | 120 | 95 | 61 | 59 | 80 | 138 | 136 | 136 | 135 | 133 | 124 | 131 | 122 | 85 | 129 | 116 | | |
| REGISTER TEMPERATURE - CORRECTED | 137 | 136 | 138 | 138 | 138 | 144 | 144 | 139 | 130 | 129 | 130 | 131 | 131 | 133 | 131 | 131 | 143 | 134 | 138 | | |
| FACTOR Q | .0145 | .0149 | .0149 | .0134 | .0144 | .0134 | .0134 | .0142 | .0158 | .0161 | .0158 | .0156 | .0156 | .0153 | .0156 | .0196 | .0135 | .0151 | .0144 | | |
| C.F.M. - CORRECTED | 190 | 194 | 124 | 87 | 90 | 179 | 95 | 100 | 205 | 864 | 63 | 60 | 58 | 91 | 102 | 156 | 50 | 80 | 138 | | |
| ROUND PIPE SIZE - BEFORE CORRECTION | 7.1 | 7.2 | 6.7 | 5.0 | 5.9 | 7.7 | 6.0 | 6.1 | 8.0 | 8.9 | 5.2 | 5.1 | 5.1 | 5.9 | 6.2 | 7.2 | 5.0 | 5.1 | 7.9 | | |
| CORRECTION FACTOR - TABLE D | 1.000 | 1.028 | 1.013 | 1.037 | .988 | .906 | .900 | .956 | 1.047 | 1.069 | 1.067 | 1.059 | 1.059 | 1.044 | 1.056 | 1.040 | .956 | 1.052 | 1.029 | | |
| ROUND PIPE SIZE - CORRECTED | 7.1 | 7.4 | 6.8 | 5.2 | 5.7 | 7.0 | 5.4 | 5.8 | 8.5 | 9.5 | 5.6 | 5.4 | 5.4 | 6.2 | 6.6 | 7.5 | 4.8/5.0 | 5.4 | 8.1 | | |
| RISER SIZE | 2½ x 14 | 2½ x 14 | 2½ x 12 | 3 x 10 | 3 x 10 | 3 x 14 | 3 x 10 | 3 x 10 | 4 x 16 | 5 x 16 | 3 x 10 | 3 x 10 | 45 x 10 | 3 x 12 | 3½ x 12 | 3½ x 14 | | 3 x 10 | 3 x 10 | 4 x 14 | | |
| REGISTER VELOCITY | 500 | 500 | 500 | 400 | 500 | 500 | 500 | 500 | 500 | 500 | 400 | 400 | 400 | 400 | 500 | 500 | 300 | 400 | 500 | | |
| REGISTER SIZE | 14 x 5 | 14 x 5 | 12 x 5 | 10 x 4 | 10 x 5 | 14 x 6 | 10 x 5 | 10 x 5 | 16 x 6 | 16 x 8 | 10 x 5 | 10 x 4 | 10 x 4 | 12 x 5 | 12 x 5 | 14 x 6 | 10 x 5 | 10 x 6 | 14 x 6 | | |

## RETURN AIR LAYOUT

| STACK NUMBER | R1 | R2 | R3 | | R4 | R5 | R6 | R7 | R8 | R9 | R10 | | | | R11 | R12 | R13 | R14 | R15 | | R16 | F.A. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ROOM USE | 127 | 108 | | | | | | | | | | | | | | | | | | | | | |
| EQUIVALENT LENGTH | 127 | 108 | 155 | | 95 | 90 | 99 | 105 | 155 | 142 | 188 | | | | 110 | 95 | 120 | 63 | 110 | | 95 | 51 | |
| C.F.M. - CORECTED | 152 | 152 | 124 | | 90 | 89 | 89 | 100 | 205 | 132 | 132 | | | | 91 | 102 | 78 | 78 | 50 | | 198 | 551 | |
| ROUND PIPE SIZE - BEFORE CORRECTION | 7.2 | 7.2 | 6.7 | | 5.9 | 5.9 | 5.9 | 6.1 | 8.0 | 6.9 | 6.9 | | | | 6.0 | 6.2 | 5.6 | 5.6 | 5.0 | | 8.0 | 11.6 | |
| CORRECTION FACTOR - TABLE D | 1.049 | 1.014 | 1.029 | | .944 | .979 | .949 | 1.009 | 1.088 | 1.078 | 1.051 | | | | 1.018 | .990 | 1.037 | .911 | 1.018 | | .990 | .791 | |
| ROUND PIPE SIZE - CORRECTED | 7.6 | 7.3 | 7.1 | | 5.6 | 5.8 | 5.6 | 6.2 | 8.7 | 7.4 | 7.3 | | | | 6.1 | 6.1 | 5.8 | 5.1 | 5.1 | | 7.9 | 9.2 | |
| STACK SIZE | | | | | | | | | | | | | | | | | | | | | | | |
| R.A. REGISTER OR GRILLE VELOCITY | 400 | 400 | 400 | | 400 | 400 | 400 | 400 | 400 | 400 | 400 | | | | 400 | 400 | 400 | 400 | 400 | | 400 | 400 | |
| R.A. REGISTER OR GRILLE SIZE | 14 x 6 | 14 x 6 | 14 x 5 | | 14 x 5 | 14 x 5 | 14 x 5 | 14 x 5 | 24 x 5 | 14 x 6 | 14 x 6 | | | | 14 x 5 | 14 x 5 | 14 x 5 | 14 x 5 | 14 x 5 | | 18 x 6 | 20 x 10 | |

## DUCT LAYOUT

ZONE 1

| STACK NO. | BRANCH TRUNK C.F.M. | MAIN TRUNK C.F.M. | RD. PIPE BEFORE CORR. | CORR. FACTOR | RD. PIPE CORR. | RECT EQUIV |
|---|---|---|---|---|---|---|
| 4 | 37 | | 5.0 | 1.039 | 5.2 | 4 x 6 |
| 3 | 124 | | 6.7 | 1.013 | 6.8 | 7 x 6 |
| A | | 161 | 7.3 | 1.037 | 7.6 | 8x6/6x8 |
| 1 | 130 | | 7.1 | 1.000 | 7.1 | 8 x 8 |
| 2 | 184 | | 7.2 | 1.038 | 7.4 | 6 x 8 |
| B | | 465 | 10.9 | 1.037 | 11.2 | 13 x 8 |
| 5 | 90 | | 5.9 | .968 | 5.7 | 4 x 8 |
| C | | 588 | 11.7 | 1.037 | 12.1 | 15 x 8 |
| 6 | 100 | | 6.1 | .996 | 6.0 | 4 x 8 |
| D | | 639 | 12.4 | 1.037 | 12.9 | 17 x 8 |
| 6 | 179 | | 7.7 | .906 | 7.0 | 8 x 8 |
| E | | 839 | 13.8 | 1.037 | 14.0 | 20 x 8 |

ZONE 2

| STACK NO. | BRANCH TRUNK C.F.M. | MAIN TRUNK C.F.M. | RD. PIPE BEFORE CORR. | CORR. FACTOR | RD. PIPE CORR. | RECT EQUIV |
|---|---|---|---|---|---|---|
| 10 | 264 | | 8.9 | 1.069 | 9.5 | 9 x 8 |
| 11 | 63 | | 5.2 | 1.067 | 5.6 | 4 x 8 |
| F | | 327 | 7.6 | 1.069 | 10.3 | 11 x 8 |
| 9 | 203 | | 8.0 | 1.067 | 8.5 | 7 x 8 |
| G | | 530 | 11.5 | 1.069 | 12.3 | 15 x 8 |
| 12 | 60 | | 8.1 | 1.088 | 8.4 | 5 x 8 |
| H | | 590 | 12.0 | 1.069 | 12.8 | 17 x 8 |
| 14 | 91 | | 5.9 | 1.044 | 6.2 | 4 x 8 |
| I | | 681 | 13.6 | 1.069 | 13.8 | 18 x 8 |
| 16 | 156 | | 7.2 | 1.040 | 7.5 | 6 x 8 |
| 15 | 108 | | 6.9 | 1.096 | 6.8 | 5 x 8 |
| J1 | | 288 | 8.8 | 1.056 | 9.2 | 9 x 8 |
| 13 | 98 | | 8.1 | 1.089 | 8.4 | 5 x 8 |
| K | | 516 | 9.8 | 1.089 | 10.1 | 10 x 8 |
| I | | 681 | | | | |
| L | | 997 | 14.3 | 1.069 | 15.8 | 26 x 8 |

ZONE 3

| STACK NO. | BRANCH TRUNK C.F.M. | MAIN TRUNK C.F.M. | RD. PIPE BEFORE CORR. | CORR. FACTOR | RD. PIPE CORR. | RECT EQUIV |
|---|---|---|---|---|---|---|
| 18 | 60 | | 5.1 | 1.056 | 5.4 | 4 x 6 |
| 19 | 198 | | 7.9 | 1.089 | 8.1 | 9 x 6 |
| H | | 258 | 8.8 | 1.052 | 9.3 | 12 x 6 |
| 17 | 90 | | 5.0 | .968 | 5.0 | 4 x 6 |
| H | | 308 | 9.4 | 1.052 | 9.9 | 13x6/13x8 |
| 7 | 95 | | 6.0 | .992 | 5.9 | 3 x 8 |
| G | | 403 | 10.3 | 1.052 | 10.8 | 12 x 9 |

ZONE 4

| STACK NO. | BRANCH TRUNK C.F.M. | MAIN TRUNK C.F.M. | RD. PIPE BEFORE CORR. | CORR. FACTOR | RD. PIPE CORR. | RECT. EQUIV. |
|---|---|---|---|---|---|---|
| 21 | 45 | | 5.0 | .994 | 5.0 | 4 x 6 |
| 22 | 136 | | 7.0 | .958 | 6.8 | 7 x 6 |
| P | | 183 | 7.7 | .994 | 7.7 | 8x6/6x8 |
| 23 | 284 | | 9.1 | .827 | 8.5 | 7 x 8 |
| Q | | 467 | 10.9 | .994 | 10.5 | 12 x 8 |
| 20 | 61 | | 5.0 | .939 | 5.0 | 3 x 8 |
| 24 | 57 | | 5.1 | .814 | 5.0 | 3 x 8 |
| R | | 565 | 11.7 | .994 | 11.6 | 14 x 8 |
| 25 | 133 | | 6.9 | .745 | 5.7 | 3 x 8 |
| S | | 698 | 12.7 | .994 | 12.6 | 16 x 8 |

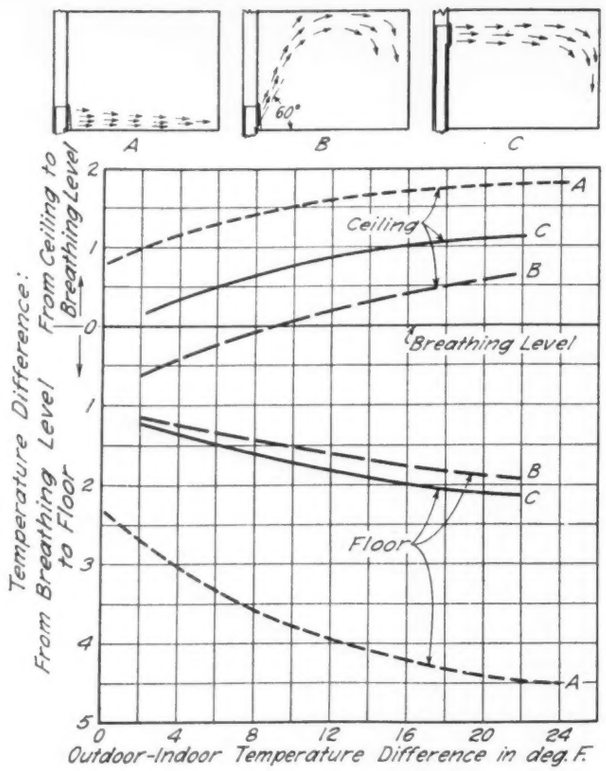



**Fig. 17. Room Air Temperature Differentials with Three Types of Outlets.**

# Register Types and Register Locations in Cooling*

THE study of baseboard and sidewall registers was made in the east bedroom of the Research Residence. This room was 13 ft. 6 in. by 20 ft., with an 8 ft. 4 in. ceiling, and had three exposed walls, north, south, and east. It had one door, which remained open during all of the tests.

The location and arrangement of the warm-air stack and registers are shown in Figs. 5 and 17. The sidewall register was the same size as the baseboard register, and was placed at the head of the extension of the stack for the baseboard register in order to facilitate changes from one position to the other. The same grille was used in both locations. It consisted of horizontal louvers, one inch in width, which could be set at any angle from 0 degrees to 90 degrees with the horizontal. In the latter case the louvers were completely closed. When the sidewall register was in use, the baseboard outlet was sealed with a flat plate placed with the inner face flush with the wall of the stack. Similarly, when the baseboard register was in use, the stack was sealed just above the baseboard outlet. Hence, in either case, the stack was continuous and without offsets or projections.

*Reprinted from Bulletin 305, Engineering Experiment Station, University of Illinois, "Summer Cooling in the Warm-Air Heating Research Residence with Cold Water."

### Temperature Gradients

The description of the registers is given in Section 9 and the test procedure is described in Section 12. Three different arrangements of the register were investigated, as illustrated by the insets in the upper portion of Fig. 17. In arrangement A the register was located in the baseboard and the louvers were adjusted so that the cool air was projected horizontally into the room near the floor. For arrangement B the louvers were set at an angle of 60 degrees with the horizontal so that the air was projected upwards into the room. For arrangement C the register was located in the sidewall at a height of 7 ft. from the floor. In this case the air was delivered horizontally into the upper part of the room.

In Fig. 17 curves are shown giving the relation between the outdoor-indoor temperature difference and the difference in temperatures between the 5-ft. level and the floor, and between the ceiling and the 5-ft. level. These room air temperatures were obtained by means of thermometers located on the central axis of the room, as shown in Fig. 5. Other temperatures were observed by means of thermometers located in the four corners of the room. The readings of these thermometers, as shown by Table 9, indicated that at the 5-ft. level the average value of the deviations of the temperatures observed in the four corners from those observed in the center of the room was not greater than 0.5 deg. F. It may be noted from Table 9 that some of the temperatures

TABLE 9
TEMPERATURE DISTRIBUTION IN FOUR CORNERS OF ROOM WITH THREE TYPES OF OUTLETS

| ARRANGEMENT | DESCRIPTION | DEVIATIONS IN TEMPERATURE FROM THOSE OBTAINED AT CENTER OF ROOM, DEG. F. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BREATHING LEVEL | | | | | FLOOR | | | | |
| | | NW | NE | SW | SE | AVERAGE | NW | NE | SW | SE | AVERAGE |
| A | Baseboard, Louvers horizontal | +0.2 | —0.5 | +0.1 | +0.2 | 0.0 | —4.1* | —3.1* | +1.1 | +0.9 | —1.3 |
| B | Baseboard, Louvers 60 deg | —2.0* | —0.2 | +0.6 | +0.6 | —0.2 | —0.7 | +0.2 | +0.2 | +0.3 | 0.0 |
| C | Sidewall, Louvers horizontal | —0.4 | —1.6* | 0.0 | +0.1 | —0.5 | +0.4 | —0.4 | +0.5 | +0.6 | +0.3 |

Note: Values preceded by (+) were for temperatures greater than, and values preceded by (—) were for temperatures less than those obtained at the center of the room.
*These values were affected to some extent by the cool air from the registers.

obtained in the north half of the room were affected to some extent by the cool air from the registers. In general, the temperature distribution in all parts of the rooms was fairly uniform, and hence the temperatures obtained in the center may be regarded as typical of those obtained in all parts of the room. It may be observed from Fig. 17 that, in all cases, the temperature gradient from the floor to the ceiling tended to increase as the outdoor temperature increased. For an outdoor temperature of approximately 100 deg. F., or for an outdoor-indoor difference of 20 deg. F., the total differences in temperature from the floor to the ceiling were 6.2 deg. F., 2.5 deg. F., and 3.2 deg. F. for arrangements A, B, and C, respectively.

The temperature gradients obtained for arrangements B and C were quite small, and even that for arrangement A was not excessively large. Furthermore, temperatures in the living zone lower than those in the upper part of the room are not as undesirable in the summer time as they are in the winter. Therefore, it is evident that the performance of registers used for summer cooling work should be evaluated from some standpoint other than that of the temperature gradients produced in the room, and the absence of objectionable air currents or drafts in the living zone is suggested as a better criterion for judging the performance of registers in this case.

### Air Circulation

As indicated by the diagram in Fig. 18, the use of arrangement A produced appreciable air currents directly in front of the register, and proved to be unsatisfactory from this standpoint. The air was projected across the floor to the opposite wall at a rather high velocity. This is indicated by the numerical values for the air velocity in feet per minute, shown in Fig. 18. These values are placed adjacent to the arrows indicating the direction and magnitude of the air flow, and, owing to limitations of the instruments used for observing very low velocities, the lower values shown must be regarded as only approximate. The path of the main air stream was such that a considerable portion of the lower part of the room was subjected to objectionable drafts. Although the use of a different type of register which would tend to spread the air outwards into the room instead of directing it straight across might serve to reduce the magnitude of the air velocity, it is probable that objectionable drafts would still be obtained in a considerable zone located in front of the register. Therefore, it may be concluded that a baseboard register with horizontal louvers of the type indicated by arrangement A is not satisfactory for summer cooling work.

In the case of arrangement B the air flow in the living zone was directed upwards to the ceiling in a path that did not extend beyond appoximately 30 inches from the sidewall. Hence, only a very small portion of the living zone was subjected to the direct action of the air from the registers. The cold air after reaching the ceiling diffused and descended into the living zone without the creation of any objectionable drafts. In this connection this arrangement proved to be the most satisfactory of the three tested.

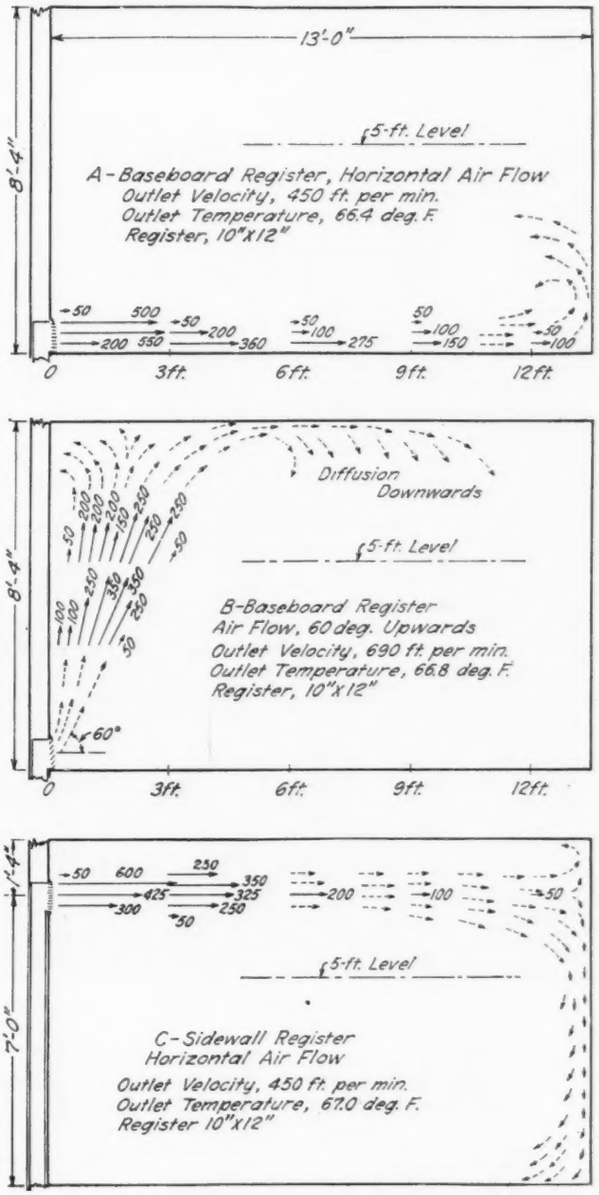



**Fig. 18. Diagrams for Air Circulation in Room with Three Types of Outlets.**

The sidewall register located at the 7-ft. level, indicated by arrangement C in Fig. 18, projected the air outwards into the room and hence did not create any objectionable drafts in the living zone, except near the outside wall. It was observed that the cool air descended parallel to the outside wall and produced an appreciable draft in a small zone near this wall. Therefore, the only limitation to be observed in connection with the use of arrangement C appears to be that the outlet register velocity should not exceed a value just sufficient to project the air to the wall opposite to the register. Obviously, the use of diffusing type registers, which spread the air outwards into the room, would tend to minimize this effect. In the selection of such

(*Continued on page* 110)

AN ATTIC VENTILATING FAN
FORCES OUT THE STIFLING MOTIONLESS HEAT FROM YOUR ATTIC DRAWS IN COOL FRESH NIGHT AIR
CREATES COOLING AIR CIRCULATION THROUGHOUT THE ENTIRE HOUSE
Sound REFRESHING SLEEP every night
A COOLER HOUSE every day during hot weather
What is it worth to you?
HEALTHFUL REST
and NEW ENERGY
DELIGHTFULLY COOL
for your evenings pleasure
An ATTIC VENTILATING FAN provides
at low cost
Arrange for a survey of your home today
Ask our hostess

# Attic Fan Promotion *by the* Washington, D. C. Electric Institute

A LITTLE more than five years ago there was organized in Washington, D. C., the Electric Institute, representing five branches of the electrical industry. The Institute is, in effect, a local trade association organized for the purpose of educating the public and the industry to the better use of electrical equipment. The membership, today, includes a total of 186 firms, among them manufacturers, wholesalers, retailers, contractors and the power company.

The focal point of the Institute activities is the display of electrical merchandise in the power company building, visited by thousands of electrical users each month. To acquaint these electrical users with the latest developments in electrical equipment, the Institute maintains an elaborate display. Here the home owner can come and see demonstrated laundrying equipment of all types, the latest in kitchen time saving equipment, hundreds of small utensils; here are staged home economics schools of all kinds; and here the home builder or remodeler can go and obtain trained assistance in planning home improvements.

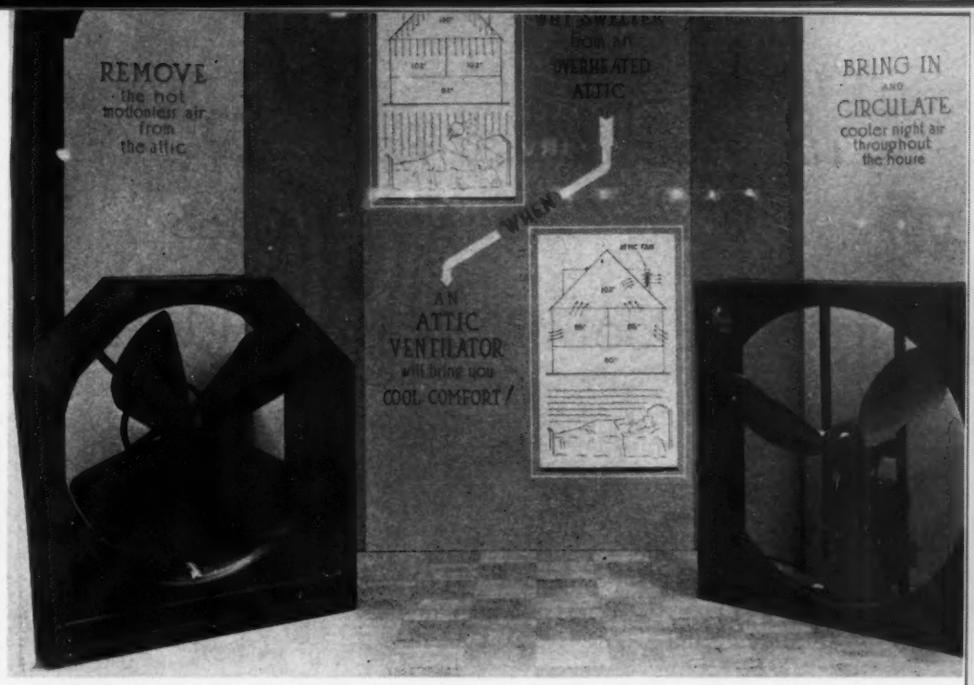
All of this service is offered free of charge and with no thought of making a sale for ever since the Institute was started the power company has stopped selling electrical items. Not even a light bulb is now sold in the building.

A very interesting activity of the Institute is the periodical staging of timely displays of electrical equipment. In season, there may be a display of stokers, oil burners, furnaces, or cooling apparatus. Each such display is tied in with a merchandising campaign whose purpose is to stimulate interest in and increase buying of, the type of equipment being

At left—Attic fans and attic ventilation featured as a part of the non-commercial display maintained by the Electric Institute of Washington. Approximately 60,000 persons viewed this display. No equipment is for sale, but hostesses explain and direct prospects to Institute members.

◆

At right—Attic ventilation was also publicised in one show window during the period July 5 to 29. Simplicity is used to stimulate interest and bring prospects inside.




featured. The extent of each campaign is determined by the number of members interested in the particular item and the proportion of the Institute's budget made up from these interested memberships.

Within the membership there are probably fifteen firms actively promoting attic ventilation or the sale of night air cooling fans. Attic ventilating equipment was, therefore, featured as a part of one of the exhibits presented this year. Each such campaign features seasonal merchandise and lasts from five to eight weeks. Attic ventilation equipment and the general idea, was included in the exhibit from June 5 to July 29. To the best of knowledge about 60,000 visitors viewed the equipment during the campaign.

The photographs show the Institute display and a show window in which attic ventilation was featured. As will be noted, both equipment and the idea are presented. The reason for this is that while attic ventilation is not at all new in Washington, the Institute has found most home owners have only a vague idea of the underlying principle and can be oversold unless these principles are understood. To serve this educational purpose the displays feature prominently just what attic ventilation is and how it works.

The Institute hopes that in 1940 a larger number of members interested in attic ventilation and an increased advertising budget will permit a program of newspaper advertising or a direct mail series.

# Air Volumes Above Sea Level

By William Scott

CALCULATED velocities and actual velocities are seldom the same. The cause of the discrepancy lies in the assumed, but convenient fiction that the air considered is at sea level and has a temperature of 70 degrees.

In any velocity problem, first find the heat losses. Then calculate the cubic feet per minute by the following formula:

$$\text{Cfm.} = \frac{\text{Btu.}}{1.08 \times \text{T.R.}}$$

Where Btu.=number of heat units.

Cfm.=cubic feet per minute.

T.R.=temperature rise.

Having thus calculated the cfm. for air at sea level at 70 degrees temperature, add 1.9 per cent for each 10 degrees above 70, and 3.7% for each thousand feet above sea level. For instance, if the calculated cfm.= 1200 for a job 2000 feet above sea level with a stack temperature of 150, the solution for actual cfm in the stacks becomes:

150—70=80

$\frac{80}{10}=8$

8×1.9=15.2 per cent excess for temperature.

$\frac{2000}{1000}=2$

2×3.7=7.4 per cent excess for altitude.

15.2+7.4=22.6 per cent total excess.

1200×1.226=1471=actual cfm.

Having found the actual cfm. proceed to find velocity at any point at any temperature or average velocity, if average temperature is known, thus:

$$\text{Va} = \frac{\text{CFMa} \times 144}{\text{PA}}$$

Where Va=actual velocity.

CFMa=actual cfm.

PA=pipe area.

Since PA is often fixed by available stack space, the minimum velocity will be limited by maximum stack area.

# Air Conditioning Facts From the Research Residence

# Cooling With Cold Water in Coils

By S. Konzo

Special Research Assistant Professor
Engineering Experiment Station
University of Illinois

IN many localities in which an ample supply of cold ground water is available, the possibility exists of cooling a structure with cold water circulated through cooling coils. In this discussion the advantages and limitations of the process will be given, as determined from the results obtained from two years of work conducted in the Research Residence (Urbana, Ill.) of the National Warm Air Heating and Air Conditioning Association. The complete report of these tests is available in Bulletin 305 of the Illinois Engineering Experiment Station.

### Selection of Cooling Coil

A diagram of the cooling plant with water cooling coils is shown in Fig. 1. "In selecting the cooling coil required to absorb the maximum cooling load on the Research Residence, it was found that there was considerable latitude in the choice, provided no restrictions were placed on the amount of cooling water or the amount of coil surface used. The curves in Fig. 2 (based on an inlet water temperature of 60 deg. F.) were computed from the data furnished by the manufacturer of the coil. The curves indicate that the required temperature drop in the air of 15 deg. F. could be obtained either by the use of a large amount of cooling water with a small amount of coil surface, or by a small amount of water in connection with a large amount of coil surface. Furthermore, the resistance to the flow of air would increase rapidly as the amount of surface,

◆

**Fig. 1—Diagram of cooling plant in Research Residence with water cooling coil. Note air circulation circuit.**

**(Right) — Fig. 2 — Computed performance characteristics for one type of cooling coil. (Both diagrams from University of Illinois Engineering Experiment Station Bulletin 305.)**

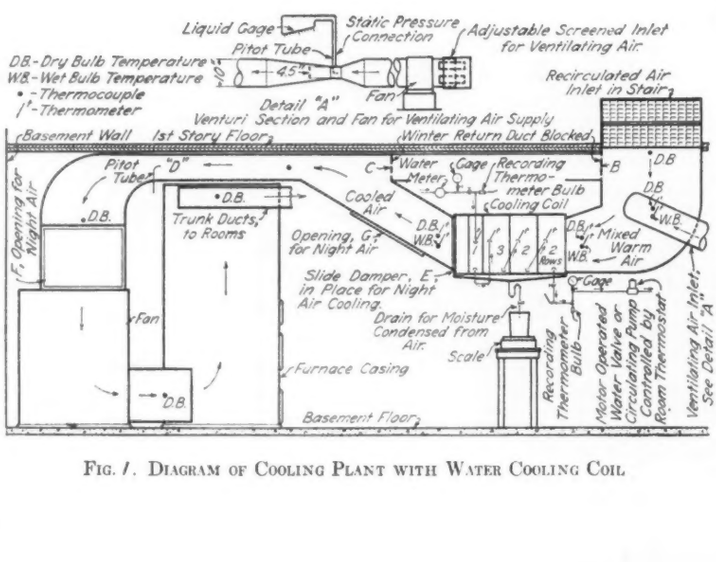
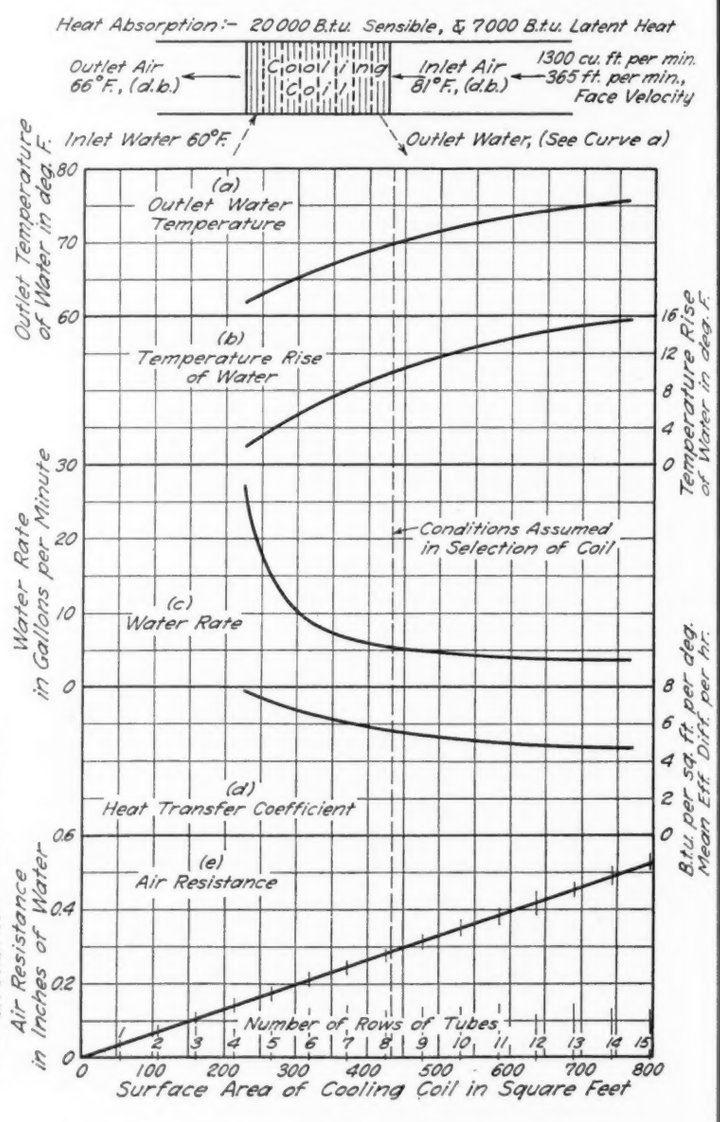



FIG. 1. DIAGRAM OF COOLING PLANT WITH WATER COOLING COIL


Heat Absorption:- 20 000 B.t.u. Sensible, & 7000 B.t.u. Latent Heat
Outlet Air 66°F., (d.b.)
Cooling Coil
Inlet Air 81°F., (d.b.)
1300 cu. ft. per min. 365 ft. per min., Face Velocity
Inlet Water 60°F.
Outlet Water, (See Curve a)
Outlet Temperature of Water in deg. F.
(a) Outlet Water Temperature
(b) Temperature Rise of Water
Temperature Rise of Water in deg. F.
Water Rate in Gallons per Minute
Conditions Assumed in Selection of Coil
(c) Water Rate
(d) Heat Transfer Coefficient
(e) Air Resistance
B.t.u. per sq. ft. per deg. Mean Eff. Diff. per hr.
Air Resistance in Inches of Water
Number of Rows of Tubes
Surface Area of Cooling Coil in Square Feet

or number of rows of tubes, increased. In addition to the possible limit imposed on the air delivery by the higher resistance, the use of a large amount of surface has the further disadvantage of high first cost. On the other hand, the use of a small amount of coil surface has the disadvantage of high operating cost due to the amount of water used. Under these conditions a compromise is necessary. In the case of the Research Residence this was effected by selecting a coil having 8 rows of tubes.

The resistance offered by the coil itself to the flow of water was only 0.5-lb. per sq. in. However, in the case of the tests made in 1935, the drop in pressure from the city main to the entrance of the coil was approximately 35-lb. per sq. in. through the ¾ in. line from the main to the coil. This loss in pressure may in some cases be the limiting factor in determining the amount of water available for cooling purposes.

The estimated resistance to flow of air of the 8-row coil was 0.29 in. of water, and this was regarded as the upper limit for the system under consideration. The total resistance of the system with the coil in place was 0.51 in. of water. Under these conditions it was found necessary to install a larger fan for the summer work. If the cooling coil had been located in the return duct just above the fan inlet without further changes in the winter system, it is possible that the total resistance would have been increased to only 0.41 in. of water instead of to 0.51 in. of water. Even this, however, is more than double the normal resistance for winter operation, and it is doubtful whether the fan used for winter operation could have been retained. In all cases in which a cooling coil is to be used the resistance of the coil and the possibility of the need for a larger fan for summer cooling than for winter heating should be given careful consideration in the design of forced-air systems that are to be used for both summer cooling and winter heating.

## General Operating Conditions

The operating characteristics of the cooling plant can best be illustrated by the results obtained on a typical day. The graphical log of temperatures and humidities shown in Fig. 3 show typical conditions maintained with water at a temperature of 58 deg. F. Similar results were also obtained with water at temperatures of 52 deg. F. and 46 deg. F. entering the cooling coil. Fig. 3 indicates that for a day in which the outdoor maximum temperature was 96 deg. F. the indoor temperature did not exceed 80 deg. F. at any time. Furthermore, subsequent tests, made during the year of 1936 when outdoor temperatures exceeding 100 deg. F. were attained daily during a two-week period, indicated that a cooling plant having a refrigerating capacity of about 2½ tons was sufficient to maintain satisfactory indoor conditions during the entire period. During periods of intermittent operation of the cooling unit, occurring during the forenoon hours as shown in Fig. 3, the indoor relative humidity varied between 80 and 67 per cent. After the cooling unit had been operated continuously the relative humidity stabilized at a value of about 65 per cent. This value of the relative humidity was considerably higher than that obtained with the mechanical condensing unit.

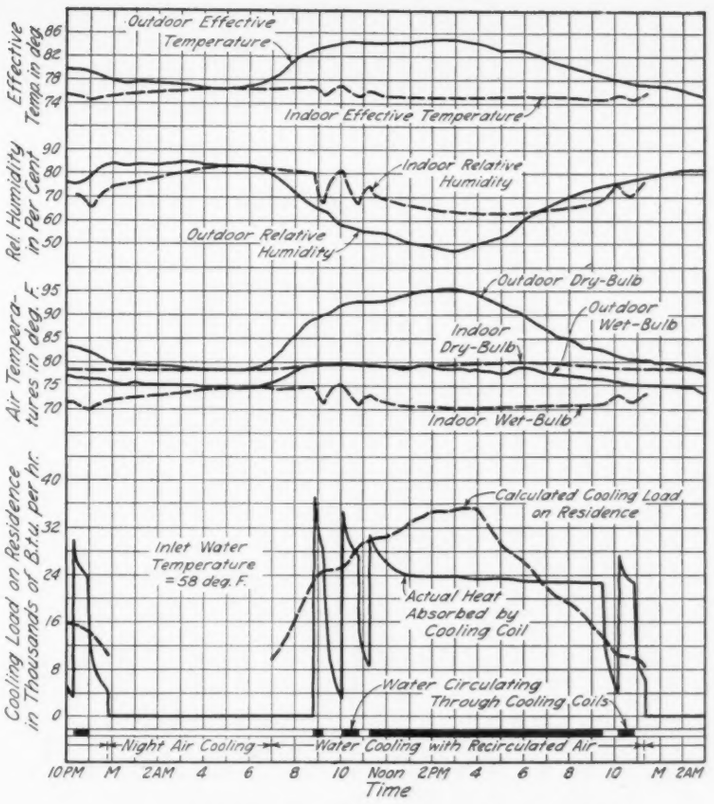



**Fig. 3—Graphical log of temperatures and humidity in the Research Residence when cooled with 58-degree water. (From University of Illinois Engineering Experiment Station Bulletin 305.)**

The results of studies made with two methods of temperature control indicated that it would be desirable to develop a means of control operating directly on effective temperature. With 58 deg. F. service water available, and with a constant dry-bulb temperature of 80 deg. F. maintained, on days when the maximum outdoor temperature rose above 90 deg. F. and the plant operated continuously, a material improvement in atmospheric conditions was effected that would be acceptable to the majority of users, even though optimum conditions were not obtained. On mild days, however, this could not be accomplished with a constant dry-bulb temperature of 80 deg. F., but by setting the thermostat to maintain approximately 76 deg. F. acceptable conditions could be maintained. The results further indicated that 60 deg. F. is probably the upper practical limit for the temperature of the available cooling water. With higher initial water temperatures the amount of dehumidification or reduction in indoor relative humidity would be very small. Consequently, room temperatures considerably lower than 80 deg. F. would have to be maintained and the amount of coil surface required would be excessive.

## Humidity Conditions Maintained

"The curves in Fig. 4 show that during periods of continuous operation, both in the case of the

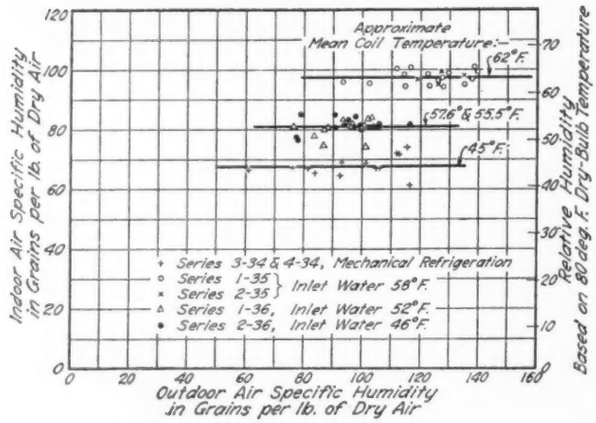

Approximate
Mean Coil Temperature:-
62°F.
57.6° & 55.5°F.
45°F.
Series 3-34 & 4-34, Mechanical Refrigeration
Series 1-35 } Inlet Water 58°F.
Series 2-35 }
Series 1-36, Inlet Water 52°F.
Series 2-36, Inlet Water 46°F.
Indoor Air Specific Humidity in Grains per lb. of Dry Air
Relative Humidity Based on 80 deg. F. Dry-Bulb Temperature
Outdoor Air Specific Humidity in Grains per lb. of Dry Air

**Fig. 4—Humidity of indoor air resulting from operation with two types of cooling systems. (From University of Illinois Engineering Experiment Station Bulletin 305.)**

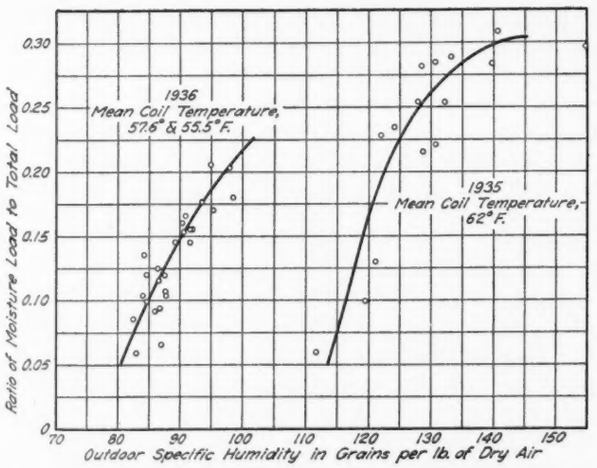



**Fig. 5—Ratio of load due to condensed moisture to total cooling load. (From University of Illinois Engineering Experiment Station Bulletin 305.)**

water coil and in the case of the mechanical refrigerating unit, the indoor specific humidity (or moisture in the air) maintained was dependent only on the temperature of the medium used and the character of the cooling coil, and was independent of the amount of water vapor in the outdoor air. Since in both cases a constant indoor dry-bulb temperature of 80 deg. F. was maintained, the specific humidity is also representative of the indoor relative humidity." That is, the water coil with a mean water temperature of approximately 62 deg. F., maintained a constant indoor relative humidity of 63 per cent during periods of continuous operation. The water coil with a mean water temperature of 57.6 deg. F. and 55.5 deg. F. for inlet water temperatures of 52 deg. F. and 46 deg. F., respectively, maintained a constant relative humidity of approximately 52 per cent for both cases. Also the evaporator coil with a mean temperature of approximately 45 deg. F. for the refrigerant, maintained a constant relative humidity of 45 per cent.

"Possibly by coincidence the numerical value of the relative humidity that was maintained in the house was nearly the same as the numerical value of the mean coil temperature." Under test conditions similar to those maintained in the Research Residence, the suggested approximation may be of some value in determining the probable magnitude of the indoor relative humidity in similar residence installations. It might also serve as an index for the selection of desirable coil temperatures.

The proportion of the total cooling load which can be accounted for by the heat required to condense moisture out of the air depends primarily on the mean coil temperature and the amount of moisture contained in the outdoor air. Fig. 5 shows that:

a. The hot season of 1936 was a relatively drier season than the more moderate season of 1935.

b. The proportion of the moisture load to the total cooling load varied from 5 per cent to 30 per cent depending on the moisture content of the outdoor air.

c. On a given day the use of a lower mean coil temperature would result in a greater amount of moisture being condensed and hence in a lower relative humidity in the house.

The indoor relative humidity conditions that have been obtained during the past six summers in the

(*Continued on page* 106)

TABLE 1
CALCULATED OPERATING COSTS BASED ON THE SEASON OF 1934

| Method of Cooling | Total Ice Required | Total Water Consumption | Electrical Input, kilowatt-hours | | | | | Seasonal Costs, dollars* | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Compressor or Pump Motor | Fan Motor | | | Total | Ice | Water | Electricity | Total |
| | | | | Night Air Cooling | Recirculation Period | | | | | | |
| | | | | | Previous to Test | During Test | | | | | |
| | tons | gallons | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Ice | 41.7 | ..... | 255 | 388 | ... | 135 | 778 | 166.88 | ..... | 24.12 | 191.00 |
| Mechanical | .... | 34 830 | 1028 | 388 | ... | 160 | 1576 | ..... | 11.50 | 48.87 | 60.37 |
| Water, 58 deg. F. | .... | 95 760 | ... | 419 | 370 | 171 | 960 | ..... | 31.60 | 29.76 | 61.36 |
| Water, 52 deg. F. | .... | 69 160 | ... | 476 | 379 | 188 | 1043 | ..... | 22.82 | 32.33 | 55.15 |
| Water, 46 deg. F. | .... | 43 890 | ... | 476 | 395 | 173 | 1044 | ..... | 14.48 | 32.36 | 46.84 |

*Notes:* All calculations based on a common season having 2658 degree-hours and 65 days with maximum temperatures above 85 deg. F. and with operating conditions as follows:

With basement fan employed for cooling with air from outdoors at night, awnings in position on all windows exposed to the sun, and temperature of 80 deg. F. dry-bulb maintained in Residence.

*Based on the following rates: ice, $4.00 per ton; water, 33 cents per 1000 gal.; power, 3.1 cents per kw-hr.; no capital costs or depreciation taken into consideration.

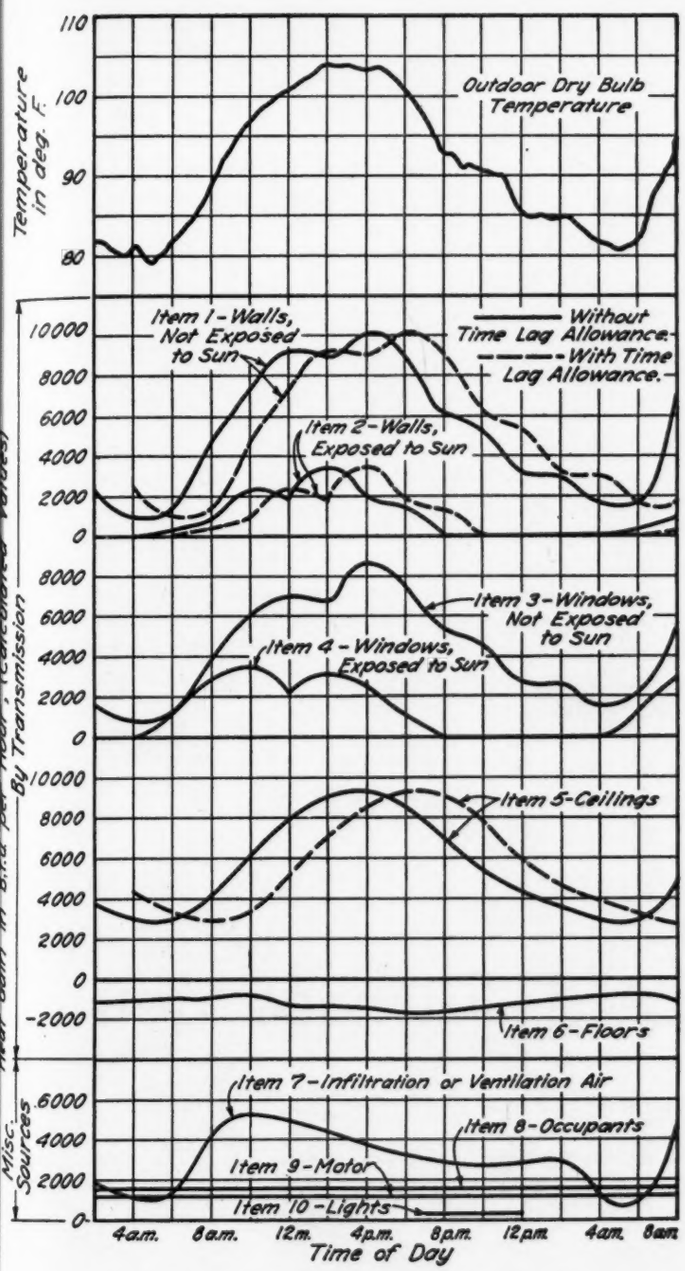

Temperature in deg. F.
Outdoor Dry Bulb Temperature
Item 1 - Walls, Not Exposed to Sun
Without Time Lag Allowance
With Time Lag Allowance
Item 2 - Walls, Exposed to Sun
Item 3 - Windows, Not Exposed to Sun
Item 4 - Windows, Exposed to Sun
Item 5 - Ceilings
Item 6 - Floors
Item 7 - Infiltration or Ventilation Air
Item 8 - Occupants
Item 9 - Motor
Item 10 - Lights
Misc. Sources
Heat Gain in B.t.u. per Hour, Calculated by Transmission
4a.m. 8a.m. 12m. 4p.m. 8p.m. 12p.m. 4a.m. 8a.m.
Time of Day

**Fig. 13—Calculated components of the cooling load on Research Residence without and with allowance for time lag.**

THE curves shown in Fig. 13 are of additional interest in that they present in a graphical manner the relative magnitudes of the ten component items that comprise the total calculated cooling load on the Research Residence on a typical day, in which the outdoor temperature attained a maximum value of 104 deg. F. The values attained by each component at 2:00 p. m., when the load was practically a maximum, have been listed in Table 4. This time also corresponds to that at which the calculations for the design of a system are very often made.

In this particular case, practically one-quarter of the calculated cooling load may be attributed to the heat transmission through the walls which were *not exposed to the sun,* and approximately one-tenth to the heat

# Structural Betterments which Help Reduce the Cooling Load†

transmission through walls which were exposed to the sun. That is, approximately one-third of the total load may be attributed to the heat transmission through the walls alone. It may be observed that by the application of effective insulation to the uninsulated sidewalls, for which the coefficient of heat transmission was 0.25 B.t.u. per sq. ft. per hr. per deg. F. difference in temperature, substantial reductions in the heat gain would be possible. This reduction in the heat gain through the walls themselves would be a function of the reduction in the coefficient of heat transmission. Since the gain through the walls is only approximately one-third of the total, the percentage reduction in the total heat gain would be approximately one-third of the reduction in heat gain through the walls alone. In addition, the time lag for the passage of heat through the walls would also be increased so that the cooling load would be distributed more uniformly with respect to the time of day.

In a similar manner substantial reductions would be possible in the heat transmission through the windows which were not exposed to the sun, provided double-glass windows could be used in place of the single-glass windows. Since all of the windows exposed to the sun were equipped with awnings, the value listed as item 4 in Table 4 was considerably smaller than that which would have been obtained had no awnings been used.*

†Reprinted from Bulletin 305, Engineering Experiment Station, University of Illinois, entitled "Summer Cooling in the Warm Air Heating Research Residence with Cold Water."

*The tests made in 1932 in the Research Residence indicated that the actual total cooling load was reduced approximately 32 per cent when the windows which were exposed to the sun were fitted with awnings. A complete discussion of these tests is presented in Engineering Experiment Station Bulletin No. 290.

TABLE 4

Calculated Values for the Ten Component Items of the Cooling Load*

| Item No. | Source of Heat Gain | Heat Gain B.t.u. per Hour | Percentage of Cooling Load |
|---|---|---|---|
| 1 | Walls, not exposed to sun | 9 080 | 24.3 |
| 2 | Walls, exposed to sun | 3 460 | 9.3 |
| 3 | Windows, not exposed to sun | 6 740 | 18.0 |
| 4 | Windows, exposed to sun† | 3 120 | 8.4 |
| 5 | Ceiling | 9 050 | 24.2 |
| 6 | Floor | —1 390 | — 3.7 |
| 7 | Ventilation | 4 500 | 12.0 |
| 8 | Occupants | 1 600 | 4.3 |
| 9 | Motor | 1 200 | 3.2 |
| 10 | Lights | 0 | 0.0 |
| | Total | 37 360 | 100.0 |

*Based on Fig. 13, 2:00 p.m., Test No. 12, July 7, 1936.
†Windows fitted with awnings.

It may be observed from Fig. 13 and Table 4 that the maximum heat gain through the walls exposed to the sun which occurred at 2:00 p. m., was 3,460 B.t.u. per hr., or only 9.3 per cent of the total calculated cooling load. The indoor-outdoor temperature difference occurring at this time was 23.4 deg. F., and the total area exposed to the sun was 463 sq. ft. If the sun effect at this time had been neglected, and the heat transfer calculated as merely that resulting from the temperature difference, a value of 2,720 B.t.u. per hr. would have been obtained. Comparing this with the 3,460 B.t.u. per hr. obtained by computations involving the sun effect, it is evident that the difference is only 740 B.t.u. per hr., or 1.98 per cent of the calculated cooling load.

Since this is within the limits of accuracy of any of the methods used for computing heat gains, it would seem that, for the purpose of obtaining the maximum load to be used for design, the more involved method taking into account the sun effect on the walls can hardly be justified in the case of a structure similar to the Research Residence.

This is not true of windows exposed to the sun, however, because if the windows had not been shaded by awnings, the resulting heat gain would have been approximately 12,100 B.t.u. per hr. instead of the 3,120 shown in Table 4, and would have constituted a large portion of the total heat gain. Hence the *sun effect on windows,* and particularly on those which are unshaded, *cannot be neglected.*

The amount of heat transmitted through the ceiling (item 5) is exceedingly large, due not only to the relatively high coefficient of heat transmission, but also to the very large temperature difference that exists between the attic space and the indoor air. The effective use of insulation should serve to materially reduce the heat gain from this source also.

The heat brought in by ventilation and infiltration (item 7) is dependent not only on the amount of air

(*Continued on page* 104)

# New N.B.F.U. Ruling Aids Furnace Men

By B. F. McLouth

Chairman, Installation Codes Committee,
Nat'l Warm Air Htg. & Air Conditioning Ass'n

A NOTEWORTHY revision to rule No. 316 of the Regulations of the National Board of Fire Underwriters has just been released. This revision, which applies to warm air delivery duct systems using direct-fired heaters, now reads, "Where such ducts enter a floor, partition, or enclosure of combustible construction within a horizontal distance of six feet of the furnace, the ducts shall be so arranged that the heated air must travel at least six feet from the closest heated surface and change direction equivalent to at least 90 degrees before entering such floor, partition, or enclosure. This is not intended to prohibit the so-called pipeless furnace."

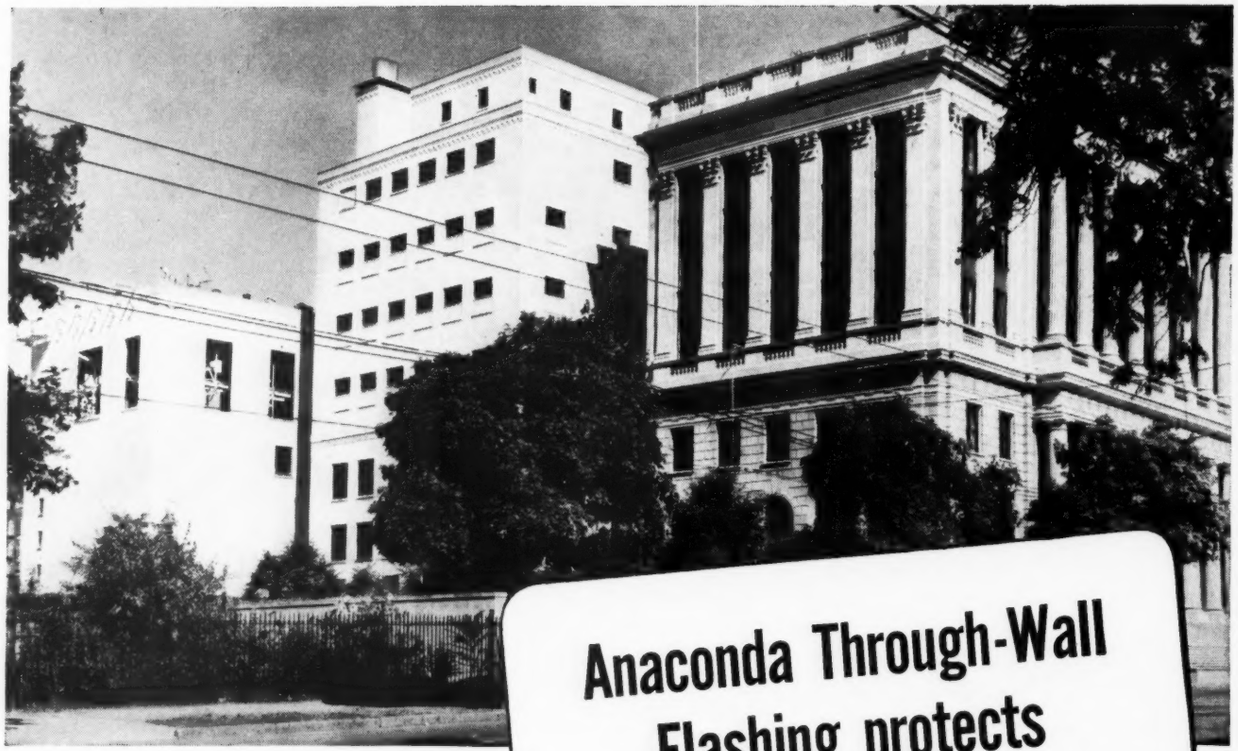
The original rule No. 316 was written in such a manner that it would prohibit a warm air run from entering a floor, partition, or enclosure of combustible construction within a horizontal distance of six feet of the furnace. It is not difficult to understand the handicap the enforcement of such a rule would place on the warm air industry. It was not the intention of the N. B. F. U. to penalize the furnace industry, but to eliminate the possibility of direct rays from the heater unit contacting combustible materials. They rightfully considered this to be a fire hazard.

The original wording of this rule was brought to the attention of The Installation Codes Committee of the National Warm Air Heating and Air Conditioning Association last July. A literal interpretation of this rule had caused considerable objection from the industry at large. In many cases FHA inspectors had rejected installations due to the wording of rule 316. The Codes Committee called a meeting of its members and a new proposed rule was drawn up. This proposed rule was sent to the National Fire Protection Association as a recommended change. At the last meeting of this association they adopted the wording as submitted by the Codes Committee and in turn recommended that the N. B. F. U. adopt this revised wording. Now the revision is official.

AMERICAN ARTISAN

# SHEET METAL SECTION

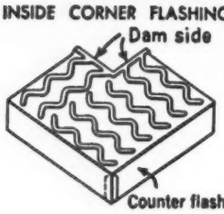
DEVOTED TO SHEET METAL CONTRACTING AND FABRICATING



*Newest addition (extreme left) to the Mutual Benefit Life Insurance Co. Building in Newark, N. J.*
Architects: *John H. and Wilson C. Ely, Newark.*
General Contractors: *Starrett Bros. & Eken, Inc., New York.*
Sheet Metal Contractors: *Chrystie Cornice & Skylight Works, New York.*

# Anaconda Through-Wall Flashing protects another modern building

**INSIDE CORNER FLASHING**




Standard inside corner flashing unit. Dam on inside; drains out.

**OUTSIDE CORNER FLASHING**

Standard outside corner flashing unit. Dam on outside; drains in.

ANACONDA
from mine to consumer

Left:
*These special one-piece corner flashings for 8" and 10" walls supplement a complete line of straight flashings which are available in 5' and 8' lengths, in standard and special widths with various selvages.*

## *This copper flashing is easy to install, efficient and positive, yet relatively inexpensive*

Made of 16-oz. copper, plain or lead coated, Anaconda Through-Wall Flashing is stocked by leading sheet metal supply houses. The following clean-cut advantages explain its fast-growing popularity:

**1.** The 7/32" high zigzag corrugations provide positive bond with the mortar in all lateral directions.

**2.** The integral dam throughout the length gives complete drainage in the desired direction. *This flashing will drain itself dry on a level bed.*

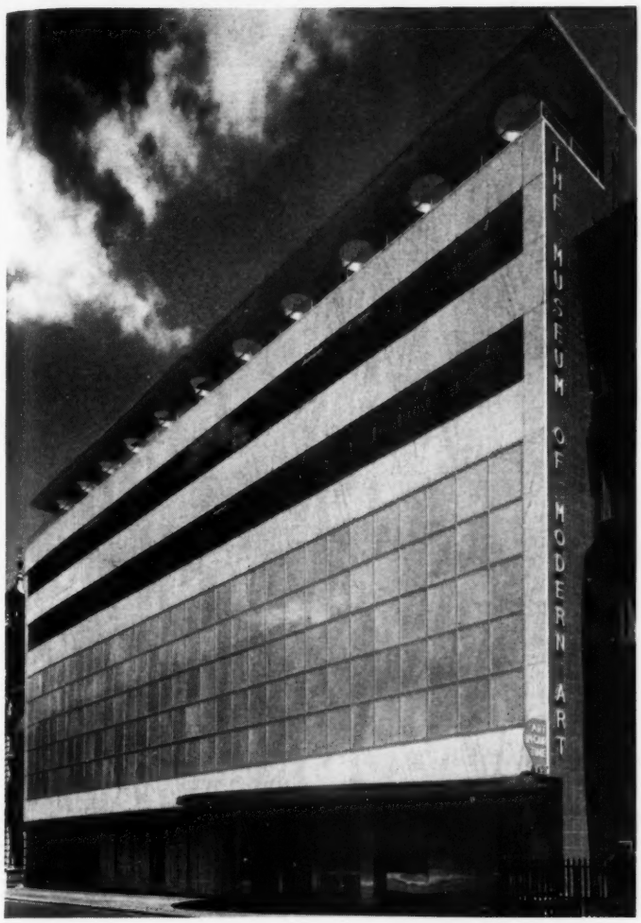
**3.** The flat selvage permits neat, sharp bends for counter-flashing or locking to adjacent sheet metal without distorting the flashing or interfering with free drainage.

**4.** Anaconda Through-Wall Flashing is easily locked endwise, even with edges bent, merely by nesting one or two corrugations. Such joints are water-tight because of the raised corrugations.

3989

# Anaconda Copper

**THE AMERICAN BRASS COMPANY,** General Offices: Waterbury, Conn.
*In Canada: Anaconda American Brass Ltd., New Toronto, Ont.* • *Subsidiary of Anaconda Copper Mining Company*




# "Modern" Metal Treatment On a Modern Art Museum

By R C. Nason

AN excellent example of what can be done by way of building wall treatment wherein stainless sheet steel comprises the great bulk of external facing is found in the recently completed Museum of Modern Art, New York Cty. The sheet metal contractor who fabricated and installed this work is C. E. Halback & Co., Brooklyn, N. Y., who not long ago also executed a similar contract in a large new Pennsylvania Railroad Terminal in Newark, N. J.

On the Art Museum, the entire first floor frontage, except plate glass windows, is made up of 87 14-gauge stainless steel panels of 18 and 8 alloy. Although panel width is 3 ft. heights of panels vary from 3 ft. to 5 ft. depending on courses, marquis, revolving and free doors and air conditioning intake grille, and other applications.

### Exterior Panel Work

Mingled with panels, made up in the contractor's shop, are a large number of similar-appearing panels of Haskelite. In both Halback and Haskelite panels ⅜-in. plywood was used for backers. In the Haskelite panels behind the plywood filler there is a stainless steel interior cover over the rear of the wood filler. Metal backs are welded to outer faces, thus sealing in the stiffener or filler material. This method of fabrication is found to prevent distortion of panels due to warping of the wood under conditions wherein inseepage of moisture might tend to warp and buckle the exposed metal.

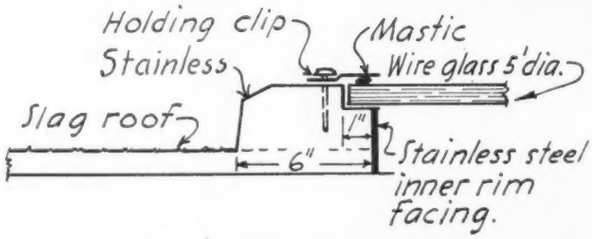
One of the illustrations shows the curved marquise. Although much of this is concrete, the outer rim, flashing and trim are of stainless steel, 14 gauge. The metal work was made up in the Halback shop on template, with radius 20 ft. 3 in. Sections were welded together and polished prior to shipment to location.

The central column is of interest. Internally structural steel and concrete provide support, while the sheet metal contractor welded numerous stainless steel flat panels in resulting square contour as covering. The face panels seen were provided with plywood filler, as already outlined. To hold the wood in place the metal edges were turned over and backward 90 deg. then clinched behind the wood. At two points on all sides were welded angle irons. Toggle bolts then were employed to fasten panels securely to masonry surfaces.

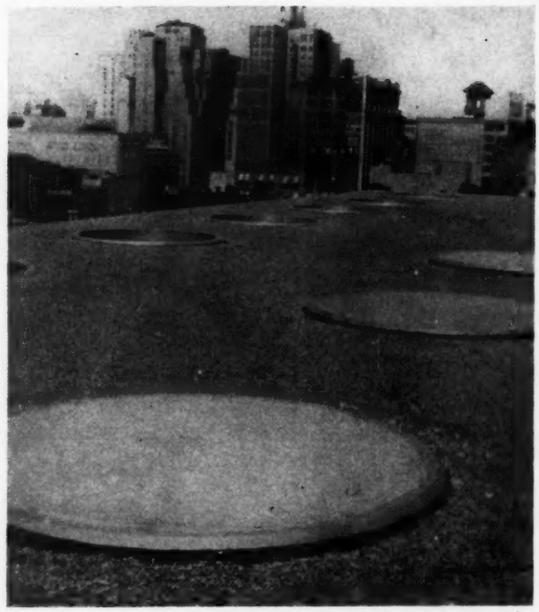
### Glass Panel Framing

The full front photograph shows numerous opaque panels directly above the first floor and through the third floor. The gridlike borders of individual s[illegible] are of sheet aluminum and alumilited f[illegible] weather resistance. The balance of t[illegible] seen is glass. Not clear, as is fam[illegible]ar, but special Italian glass known as Thermolux, which admits light although cannot be seen through. Its general color is gray, thus matching closely the natural color of the sheet metal.

The aluminum borders are extruded shapes on T-bar steel cores, the latter material being essential to overcome natural construction pressure. In point of fact the aluminum plus the steel make up almost the entire wall except for the glass. The strips of aluminum observed are 3-in. wide, about 14-gauge material. Slots hold the glass in place while considerable plastic was used as also is true of the stainless steel panels of the street floor, to fill




**Above—Details of construction of the circular skylights and covers which admit light through the projecting roof of the penthouse. The actual installation is shown in the photograph at the right.**

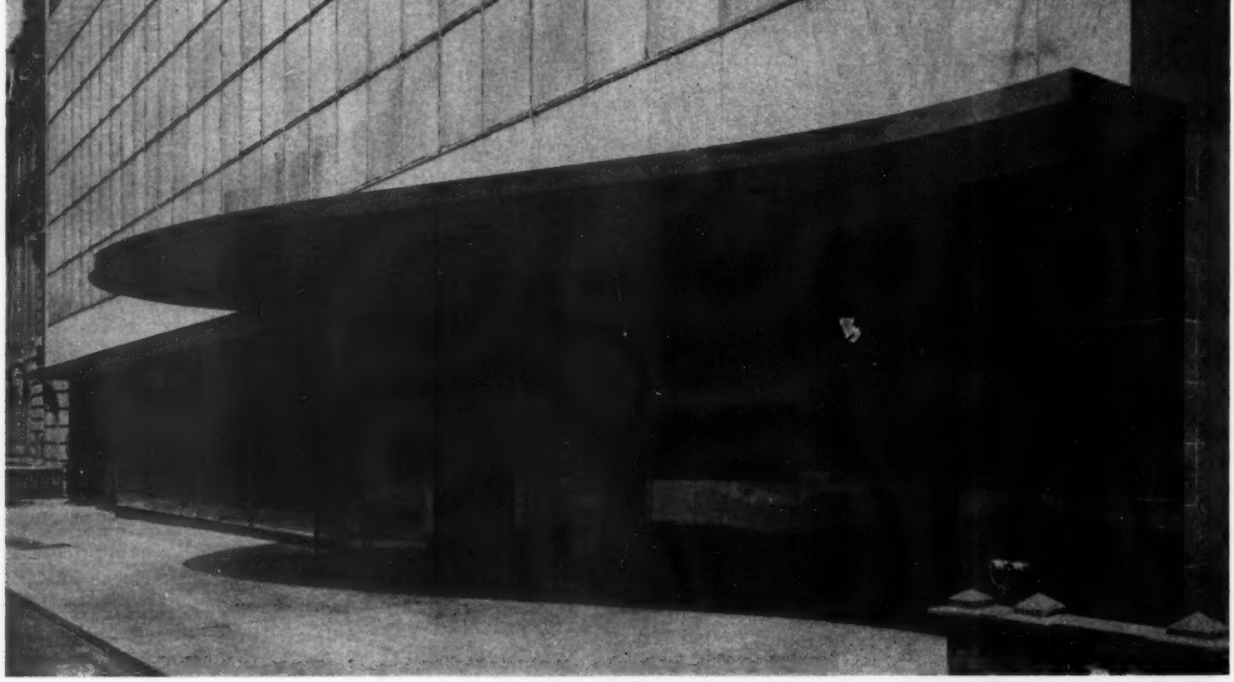


fissures between metal panels and/or metal and glass. All stainless steel sheeting was polished satin, or No. 4, finished before leaving the Halback plant.

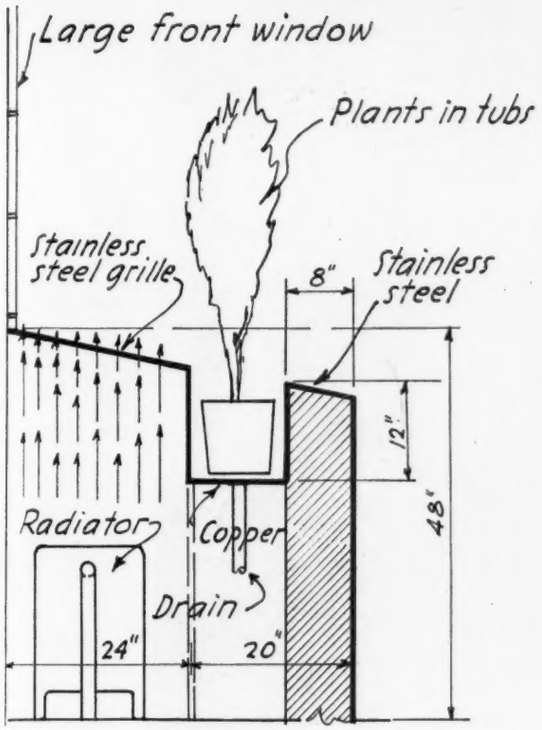
There is a 4 ft. high by 7 ft. 6 in. long air conditioning intake grille of stainless steel in the wall immediately over the doors noted behind the central column. Both revolving and swinging doors also were fabricated and installed by Halback, most of the work being tubular, and otherwise, hollow, this type of design favoring lightness in manipulating doors. All trim about the large plate glass windows was made of the same metal and by the same contractor.

The Museum of Modern Art here discussed usually is represented as a six-story structure, 130 ft. frontage and extending back about the same distance. A staggered penthouse, however, virtually adds another story. In front of the fifth floor there is a mezzanine as noted. Its roof running some 25 ft. inward has 14 round openings. Eleven of these openings are open, but there are three additional "holes" in a row behind them. All are 5 ft. diameter. The interior circular openings have wired glass "covers" that virtually make them flat skylights.

As the Museum building faces south, it was assumed that protection against sun-glare would be necessary. This is provided for first by tilting the roof slightly, second by providing the open round openings and, third, by placing opaque glass skylights in the interior row of "holes." In all instances the rims of the openings are faced with

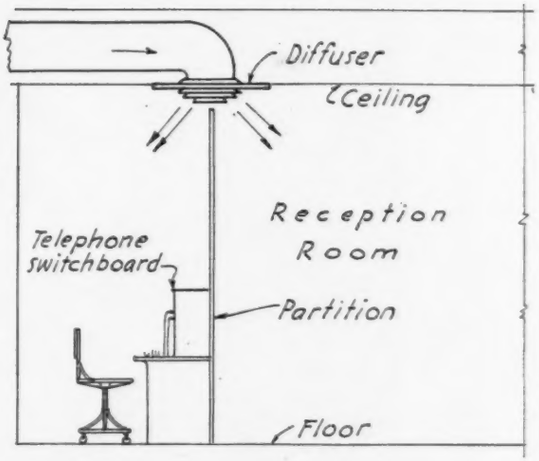


**The stainless steel panels of the first story; the recessed and curved entranceway with interesting center column; and the metal framed glass walls of the second and third floors are pictured here. The text explains how the stainless steel is supported by a backing of plywood.**




**At left—Flower box 50 feet long placed in stainless steel metal radiator cover along inside face of the large front glass window. The plants act as a light screen.**

**At right—Anemostat placed directly above a partition supplies air to two rooms, requiring one duct, plastered in.**




14-gauge stainless steel, mill finish. Metal rims are screwed to the 1-ft. thick reinforced concrete roofing. An ingenious pattern of rim cover, of the same metal provides a shoulder for reception of the glass. Clips or cleats every 18 in. hold the glass securely.

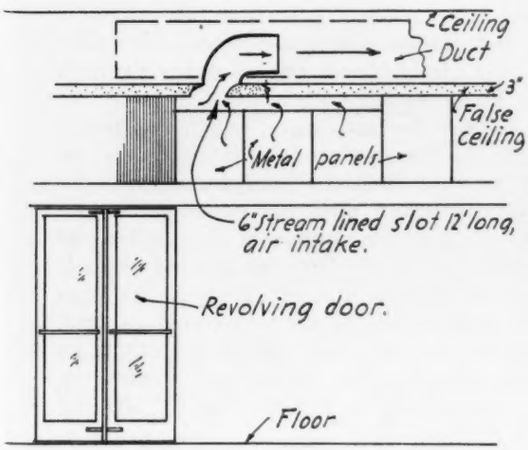
Also seen in and about this building of interest to sheet metal men is considerable flashing, wall and parapet protective flashing, gutters, leaders and a dozen kinds of general sheet metal work of copper, made and installed by Benj. Riesner & Son, this city. Another feature is a combination radiation jacket and window box for flowers and plants furnished by the heating, ventilating and air conditioning contractors, Baker, Smith & Co., New York City.

Despite the fact that the aforesaid Italian glass of the building's front is opaque, more light was admitted than was desired. Hence, the heating contractor in covering a bank of fin-type standing radiation beneath a 50- ft. stretch of front window sloped the stainless steel grilled radiation covering downward.

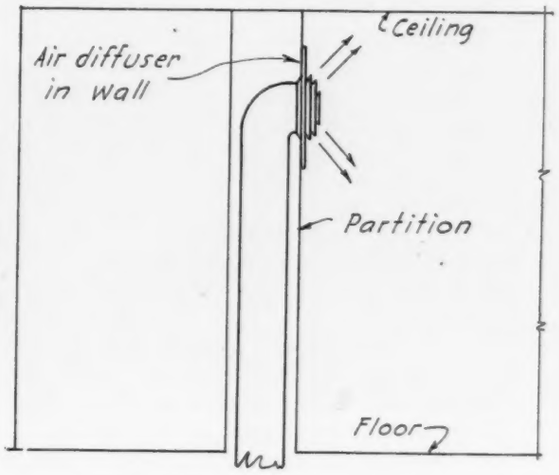
To the lower edge the contractor soldered a continuous copper-lined flower box, average depth of 18 inches by 20 inches wide. Suitable drainage enables placing therein both potted plants and those grown in loose soil. At present the trough, or box, holds a score or so of tall large-leafed plants that decorate as well as intercept light. It is assumed that during winter months plants used will be abbreviated so that more light is admitted.

Notable of the air conditioning features seen are, first, the almost universal application of concentric-ring anemostats for air distribution without draft; also the fact that several such distributors are in upper sidewalls instead of the more usual placement in ceilings. In another instance, that of a switchboard operator's room and adjacent reception room, the partition between them runs up to the center of the Anemostat, thus permitting about equal volume of air to enter both rooms simultaneously.

Several long air-intake ceilng slots in the first floor ceiling being some 12 ft. long by 6 in. wide, were streamlined, ungrilled and cut on the bias instead of straight, as is more commonly observed. The air conditioning contractor also lined two large air-supply wells on the roof, rooms being thus "open" plenums, wth sheet copper, flat seam construction. These areas are 12 ft. deep by 12 ft. square. Flat roof areas are of slag, this work being done by Tuttle Roofing Co., New York City.




**At left—Above the entrance door the 12-foot air exhaust slot diagrammed prevents outside air from causing drafts in the lobby. At right—Anemostats were also used in side walls in place of the customary ceiling location.**



# Twin-Fan, Individual Unit System For Collection of Steel Grit

K. E. ANDERSON, of General Sheet Metal Works, Rockford, Ill., was consulted on an unusual material collection problem not so long ago and solved the difficulty with an ingenious battery of indoor collecting boxes connected to twin fan units placed close to the source of the material to be collected.

The installation is located in the plant of the Rockford Drop Forge Co. The material to be collected is emery dust and steel grit—fairly heavy, but fine—which comes off the die blocks as the mechanics use high speed grinders and brushes to clean up the castings. The benches where the grinding is carried on are on the first floor of the two-story building, along an outside wall. The high speed grinding wheels (emery) remove the steel as grit particles and before the collecting system was installed this mixture filled the air of the shop. The emery dust-steel grit laden air was highly injurious to other work carried out in the room and unhealthful for the workmen.

The first thought was to place a fan in a housing behind the bench and blow the air directly out of doors. So much material was handled, however, that this was abandoned immediately. A trial installation of this type, also failed to collect the grit and dust because the fan lacked "pull."

A second idea was a central duct system connected to one large fan located remote from the benches and connected to a cyclone. The chief drawback to this, however, was the irregularity of the grinding operations. With such a system the full fan would have to run even though only one mechanic was working. A study of the shop showed that while all eight finishers might be working, five or less, and sometimes only one or two, was more customary. Also, it was desired to avoid any large cyclone mounted outside if possible.

The installation shown in the photographs was developed to meet these complicated requirements. The installation is not one unit, but eight units. All may run; one may run, but only the minimum of power is required in either case. There is no outside cyclone; instead a series of eight collecting boxes are located at the ceiling of the second floor, out of the way and within easy reach of the men who empty them. Round pipes, close to the wall run from the fans on the first floor to the boxes on the second floor and require a minimum of installation. Exhaust air is blown out of doors through rectangular pipes topped with a weather cap.

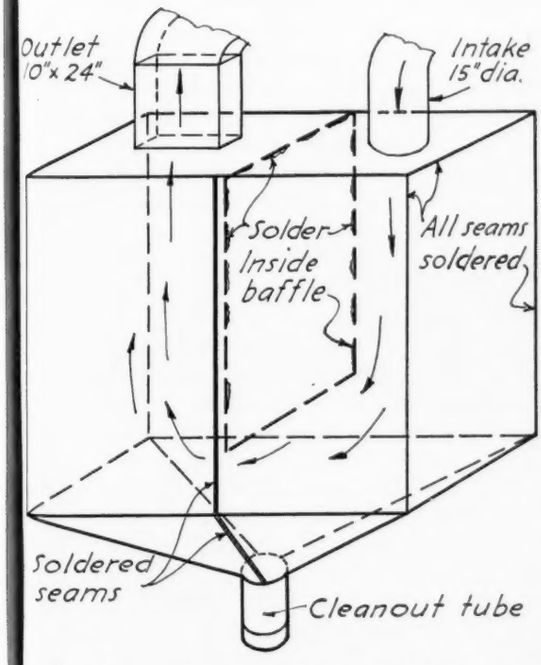
Directly behind the benches on which the grinders work, Mr. Anderson placed his intake boxes, as shown. A short transition from rectangular to round joins the round pipe fan housings to the intake box. To get the volume of air required to move the material 3,000 cfm were needed at each bench. To get this volume two four-bladed, propeller fans, each housed in its own round cabinet, were mounted together, one above the other, as shown in the photograph. These fans running at 1750 RPM, in the tight system will move 3,000 cfm against 1.4 inch pressure.

On facing page—View of row of eight grinding benches. Twin propeller fans (mounted one above the other) are housed in the round sections above the intake hood. Air and grit pass outside through pipes shown in lower photograph.

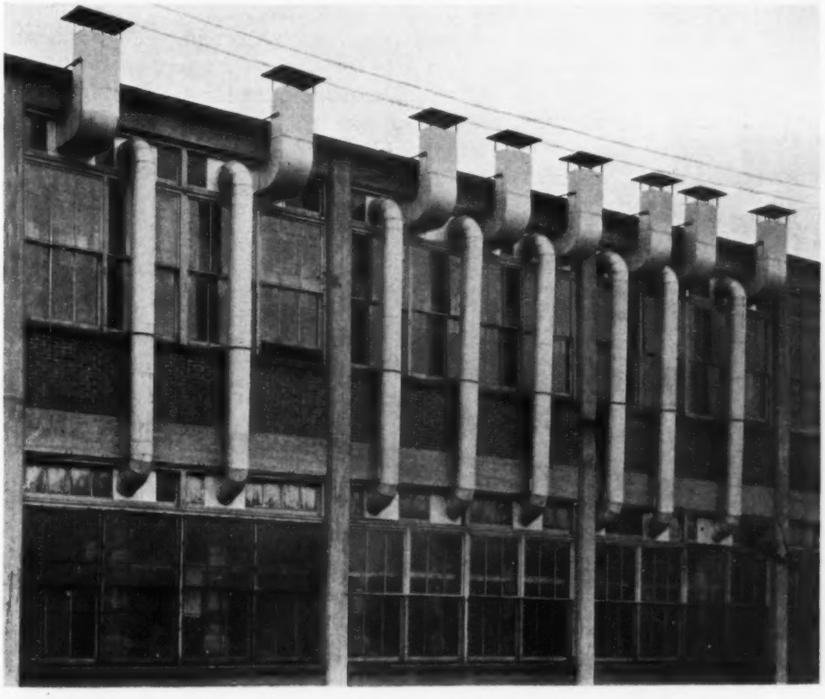
Right—The boxes in which the steel and grinding grit is collected are hung from the ceiling of the second floor. Each twin fan unit has its own box. Air enters and leaves through the outside wall as shown in photograph and sketch below.

The air and collected materials pass through the fans, through the pipe outdoors and into the boxes on the floor above. Each box has a center baffle to create two low velocity air compartments. The velocity drops, the materials fall to the clean out pipe and the used air passes out of doors.

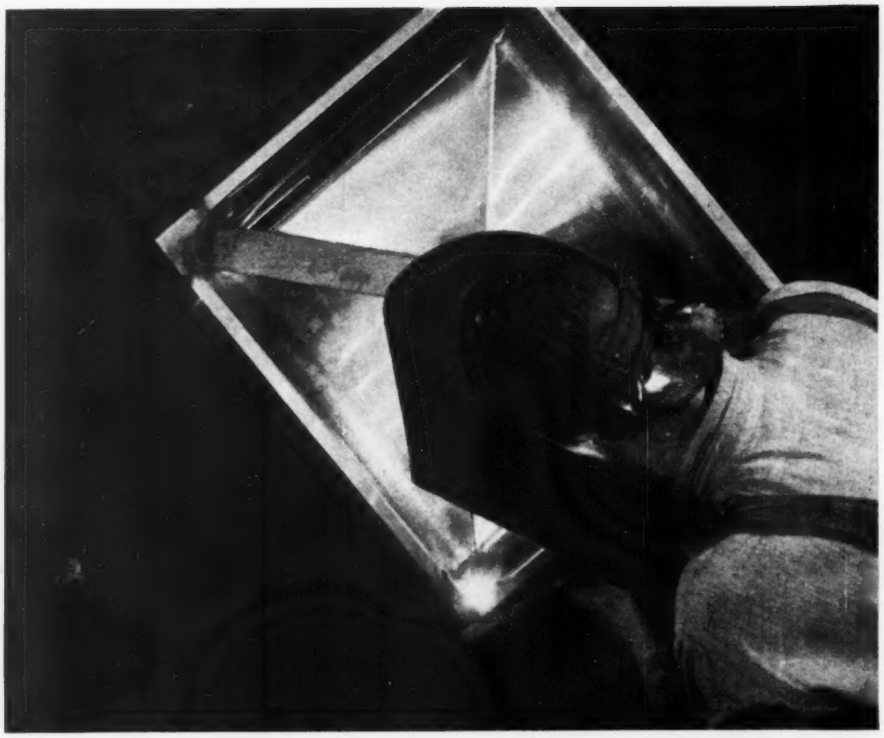
This system has proved to be highly flexible, economical in operation, removes materials so satisfactorily that the shop air is now entirely free from dust and grit, removal of collected material is easy and in case any one fan fails to function that one fan can be shut down and the remaining twin run or the unit can be shut down. Three and one-half tons of galvanized iron were used.




Construction of a collection box showing inside baffle, the round pipe entry and the rectangular exhaust which is capped as shown in the picture at the right. Compare with photograph above.



The round pipes from the twin fan units to the collecting box and the rectangular exhaust pipes are shown here outside the building. This system is unusually flexible and takes a minimum of factory space.



# Fundamentals of Sheet Metal Welding*

## PART 2

IN the sheet metal trade, any device used to locate and hold in position metal members preparatory to joining by welding is known as a "jig." Reference has already been made in Part 1 to the important part played by jigs in the control of expansion and contraction. In addition, the use of jigs makes possible greater economy in production and greater accuracy in the finished product.

A properly designed jig will provide the welding operator with the most convenient facilities for handling the work. This convenience will be reflected in improved quality, increased welding speed, and economy in welding-supplies and gases. Moreover, the jig will assist in assembling the various sheet metal members and in aligning the edges to be joined, all of which tends to reduce the final cost of the product.

One of the most important advantages to be gained through the use of jigs is the assurance of precision in the finished product. The jig, if correctly designed and built, will automatically act as a gauge on the size of the article and thus consistently provide exact dimensions as desired.

Jigs may be simple or elaborate. The foregoing advantages will be realized to the fullest extent only where the jig has been designed as needed, with little thought given to cost. Obviously this course can be taken only in the case of mass production. Where production is spasmodic, a costly jig will not be justified unless accuracy is absolutely essential. Simple work-holding devices can generally be used for the odd job. Where a few items each of many sizes are being continuously produced, a compromise between the simple and the costly, elaborate jig design may be effected by building flexible, multi-purpose jigs, a good example of which is the so-called "spider," with adjustable, radial arms, to be used in the fabrication of cylinders of many sizes.

### Simple Work-Holding Devices

In welding butt joints, it is common practice to use two heavy bars to space the sheet. These are placed parallel to the seam an inch or so back from the joint after the sheets have been properly spaced. See Fig. 1. The weight of the bar tends forcibly to minimize bulges and dents in the sheet, and also to retard lateral movement of the sheet. In this manner it regulates somewhat the speed at which the far ends are brought together by the heat of welding. By increasing the weight of the bars or by providing means for clamping the bars down, this simple jig can be made to restrain more completely the movement of the sheet metal members, as shown in Fig. 7. Heavy bars will also serve to minimize distortion by conducing some of the heat out of the sheet. Where the cost is justified, the bars can be cast hollow and water-cooled or copper insets can be provided; either course presents greater facilities for heat removal.

*Reprinted by permission from Oxy-Acetylene Tips, April, 1939.

**Right—Fig. 7—The tank seam is aligned for welding by the bar-clamps shown. This jig holds both edges in position and is quickly clamped or opened.**

Eccentric clamping arrangements may be used for tightening purposes. There are two types, the eccentric shaft and the eccentric lever, both of which provide great ease in inserting, locking, and removing the work from the jig. The eccentric shaft should be arranged so that half a turn causes the wider portion of the shaft to bear on a connecting rod thus exerting pressure. See Fig. 8.

### C-Clamps and H-Clamps

In other cases, proper alignment and satisfactory results can be secured with C-clamps. C-clamps are obviously restricted to use at the end of the seam, and wedges of some kind must therefore be used where the seam is of any length. Similarly, C-clamps can be used in making a corner weld in a rectangular container by clamping the two edges to a section of angle iron. To permit penetration, the corner of the angle iron should be ground off. See Fig. 1.

Another very useful yet simple type of clamp is the H-Clamp. These clamps are especially useful when welding long seams in light gauge sheet. They can be placed at any point along the seam in any desired number. This is a valuable feature in that the sheet can be spaced at close intervals, thereby lessening the possibility of serious deformation. As the welding progresses, the clamps can be removed one by one, or they can be moved along the joint a sufficient distance ahead of the welding to assure correct spacing until the weld is completed.

The so-called double L-clamp is a variation of the H-clamp. A section of T-iron is slotted to receive a wedge-shaped key. A flat, slotted plate is placed over the vertical section of the T. The sheet edges are placed between the horizontal section of the T and the flat, slotted plate and are held tight by driving the key into the slot.

This clamp and the other clamps just described are simple, inexpensive, and easily fashioned with the blowpipe from scrap material. Thus they can be made up to the requirements of each particular job. The bar and the clamp are just a few of the many simple work-holding devices that can be found in every shop. Such items as V-blocks, straps, angle iron, rail, and simple levers can be used to advantage in general sheet metal fabrication.

### Special-Purpose Jigs

Special purpose jigs, which in many cases amount to elaborate developments of the principles underlying the bar and the clamp as described above, can be broadly classified as tack-welding jigs or jigs in which the work is held until finished.

It is at times preferable to align and fasten together temporarily by tack-welding the various sheet metal members in a separate jig. The assembly of a particular piece of equipment may be so complex that the jig required would not give the operator convenient access to all parts of the seam to be welded. Final welding may be handled in a second jig; or the tack-welded article may be welded without a jig, provided proper allowance has been made for distortion beforehand. The majority of jigs are designed primarily to eliminate

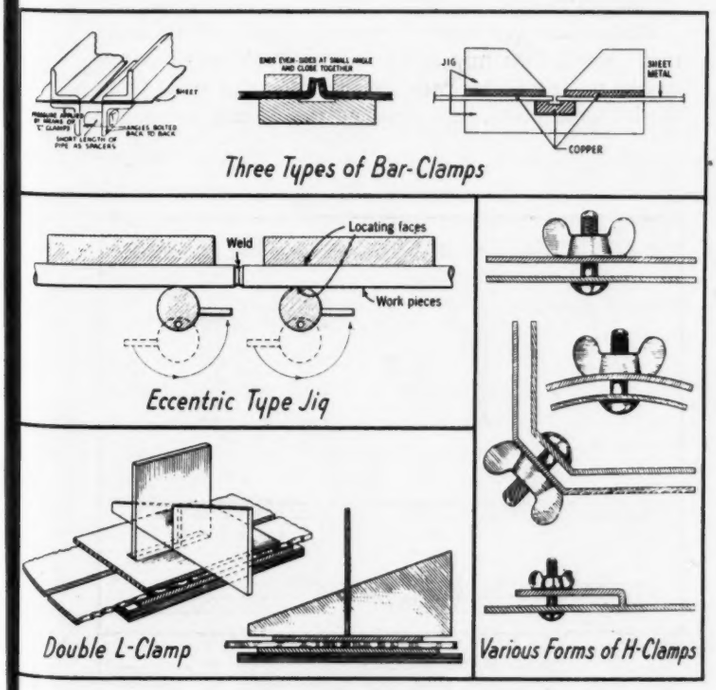



**Fig. 8—Group of simple clamping devices invaluable in sheet metal welding. The bar clamps and H-clamps are particularly useful. The text explains usage in detail.**

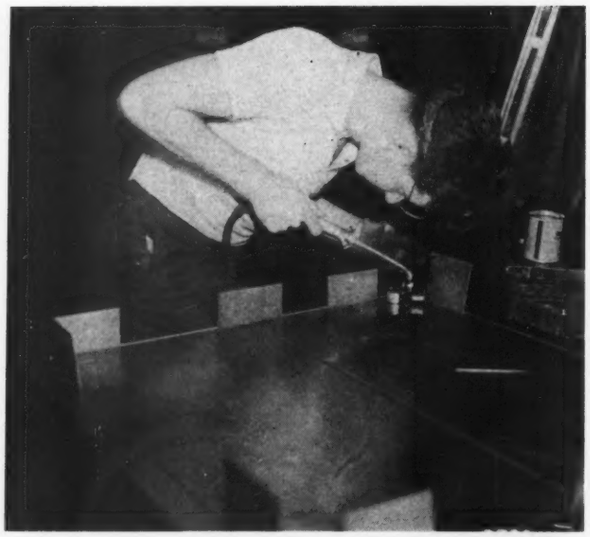


**Fig. 9—Pieces of scrap metal being used to correctly space two pieces of 18-gauge stainless steel during welding.**

tack-welding and thus greatly reduce handling time and cost of production. These jigs, in which the parts are assembled and held until welding is complete, may be classified as stationary, freely movable, semi-automatic, or automatic.

Where the jig design makes it necessary for the operator to move about the work, the jig is termed "stationary." This type of jig is generally used in connection with large work.

In the event that the work is small, it is of great convenience to the welding operator to have the facility of moving the jig at will. An example of this type of jig is the supporting roller often used to rotate the work when welding circumferential seams in round tanks.

A semi-automatic jig is one that is self-directing in its movement and can be controlled by the operator in its rate of movement so that welding, in the proper sequence, can take place without interruption. These jigs are generally hand or foot operated by the operator and are motivated mechanically by ratchets, pulleys or levers.

Automatic jigs, which are usually motor driven, have been developed for many production welding operations and especially for the manufacture of relatively small parts in quantity. The movement provided by these jigs places the point to be welded constantly before the operator. Speed of movement can be uniform, variable, or intermittent. This is arranged to suit the particular job at hand.

## Principles of Jig Design

In the design of all types of jigs, there are certain fundamental considerations that should be made.

*Simplicity.* Jigs should always be as simple in their design as the purpose for which they will be used permits. They should function smoothly and rapidly, thus facilitating loading and unloading.

*Rigidity.* The jig must be sufficiently rigid to withstand stresses that may develop in operation and, therefore, to hold the work in correct alignment until the welding is completed.

*Rapid Action.* All clamps should operate easily and rapidly and should be positioned away from the welding flame so that they will not overheat. To avoid loss or misplacement all clamps should be made integral parts of the jig.

*Accuracy.* Care should be taken to place all locating points so that the members to be welded can be positioned accurately with minimum adjustment by the operator. Accuracy in the finished work will depend upon this feature. Locating points usually consist of pads, bosses, lugs, pins, studs, V-blocks, stationary or movable screws, cup and cone arrangements, and finished holes, corners, and edges. They may be cast solid with the jig body, permanently fixed to it, or adjustable. Adjustable locating points are often desirable from the standpoint of flexibility. Whatever their nature, all locating points must be firm and rigid so that they will not be forced out of alignment as the work is clamped or when the work is heated during welding.

*Accessibility.* The jig itself should be so designed and all protruding parts so located that the seams will be easily accessible. Also, jigs should be designed so that the work can be inserted only in the correct position.

Quality and accuracy of the finished product demand full and careful consideration of these design principles. The extent to which these principles may be embodied in the selected jig design will be determined by the cost of the jig and the savings which may be effected through its use as well as by quality and accuracy requirements.

## Choice of Joint Design

There are three general types of welded joints in sheet metal work; the butt weld, the flange weld, and the lap weld. Lap joints, as the name implies, are those in which the weld is made after the sheets have been overlapped. For strength the weld is usually made double. Because of inherent disadvantages this joint is not recommended for use in welding.

Butt welds are more frequently employed in sheet metal work than any other type. Welds of this type can be made (1) between two flat pieces of sheet lying in the same plane, (2) between two sheets forming a

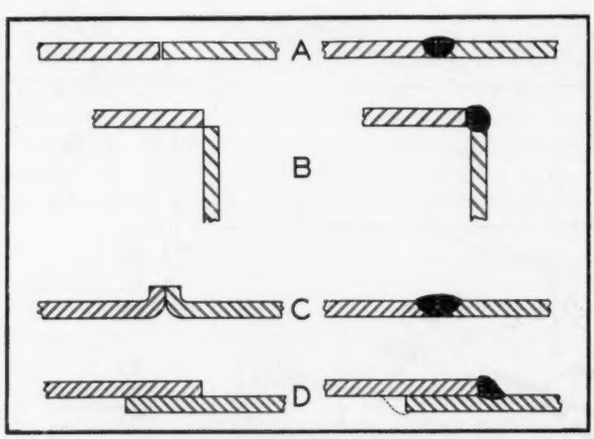



**Fig. 10—Typical joints used in sheet metal welding—(a) butt weld, (b) corner weld, (c) flange weld, (d) lap weld.**

corner, and (3) in rounded sections such as the longitudinal seam of cylindrical objects. Butt welds usually have additional metal supplied in the form of welding rod. This permits the joints to be finished either flush with the sheet or reinforced to a slight degree.

A type of welded joint particularly useful and preferred on sheet lighter than 20 gauge is the flanged joint. The edges are flanged, brought together, and fused down; welding rod is seldom used. With this joint, particular care should be taken in securing good penetration and eliminating the film of oxide that is likely to exist between the projecting edges.

To obtain consistently a welded seam of good quality, it is obvious that the edges of the sheet metal members should be well aligned. This means that the edges should come together uniformly.

### Weldability of the Material

The welding quality of the sheet has much to do with the success of sheet metal welds. For plain low carbon grade of steel this quality pertains more to the impurities in the sheet and how it was made rather than to its chemical composition. With certain grades of corrosion-resistant steels and other alloy steels, the chemical composition is very much tied in with weldability. The best of operators will have trouble in welding poor sheet, and it is therefore desirable that preliminary tests be made to determine the weldability of the sheet.

### Cleaning Preparatory to Welding

Good welded joints are dependent upon thorough fusion of the weld metal and the parent metal. Every precaution should be taken to prevent foreign matter in any form from appearing in the weld metal. Providing the sheet metal and the welding rod are of good quality, this can be done by making sure that the welding rod and the edges of the sheet are clean. All traces of dirt, rust, or heavy mill scale can be easily removed with a file, an emery wheel or a wire brush. The oxy-acetylene blowpipe can be employed effectively in burning off grease or oil and is very useful in removing undesirable scale. As a double safeguard, it is common practice to use a flux in welding non-ferrous metals and some ferrous alloys. A good flux, properly applied, will supplement the mechanical cleaning, and, through chemical action, rid the metal of all remaining impurities.

### Welding Procedure

The strength of the weld is dependent upon thorough fusion which can be assured only by following recommended welding practices. These practices include proper use of the blowpipe, selection of the correct size of tips, the setting of the proper gas pressures, and choice of the proper size of the welding rod and its correct use.

The welding blowpipe should be held at such an angle that the molten metal is not forced ahead by the flame on relatively cool and unfused edges of the sheet. It is a common fault for the welding operator to hold his blowpipe too nearly parallel to the surface, thus blowing ahead the fluid weld metal on sheet edges which are not hot enough to receive it. On the other hand, if the welding blowpipe is held too near the vertical position it will be difficult to avoid burning holes in the light sheet metal. Some practice is necessary to strike the happy medium. Metal from the welding rod must flow into the area under the welding flame, and only at the point where the base metal is actually liquid. The quantity of rod added should be regulated so there will be no tendency for the added metal to flow ahead of the welding and on to unfused edges, which would result in adhesion rather than fusion. The tip of the welding blowpipe should be cleaned regularly for best operation.

Table 1—Recommended Tip Sizes for Welding

| Thickness of Metal | | Oxweld W-15 Blowpipe | | Prest-O-Weld | | Purox | | Speed Linear Ft. per Hr. |
|---|---|---|---|---|---|---|---|---|
| Inches | Gauge | Tip Size | Oxygen Pressure, Lb. per Sq. In. | Tip Size | Oxygen Pressure, Lb. per Sq. In. | Tip Size | Oxygen Pressure, Lb. per Sq. In. | |
| | 28 | No. 1 | 16—24 | No. 1 | 2—4 | No. 1 | 1—2 | 30—40 |
| | 25 | No. 2 | 16—24 | No. 2 | 2—5 | No. 1 or 2 | 1—3 | 27—36 |
| 1/32 | 22 | No. 2 or 3 | 16—24 | No. 3 | 3—6 | No. 2 | 1—3 | 25—32 |
| 1/16 | 16 | No. 3 or 4 | 16—24 | No. 4 | 4—8 | No. 3 | 2—4 | 19—29 |
| 3/32 | 13 | No. 5 | 16—24 | No. 5 | 6—11 | No. 4 | 3—5 | 16—23 |
| 1/8 | 11 | No. 5, 6 or 7 | 16—24 | No. 6 | 9—14 | No. 5 | 4—6 | 12—20 |

### Penetration

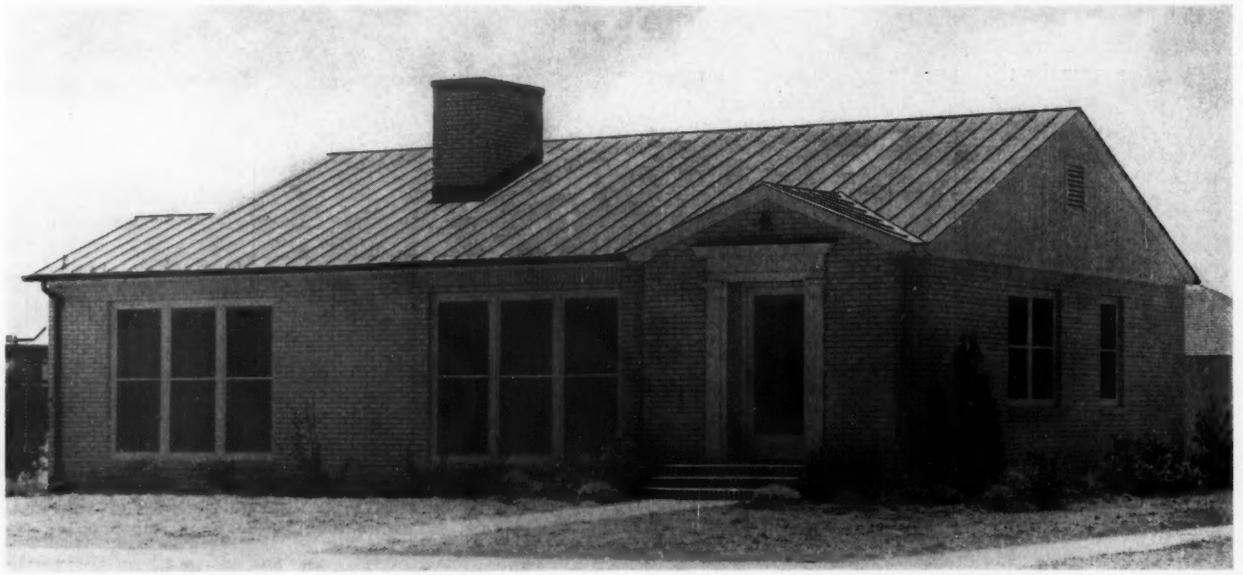
The strength of the weld is also dependent upon thorough penetration. If the penetration is insufficient, that is, if the weld metal and the parent metal are not fused through the full thickness of the sheet, the weld will obviously be lacking in strength. Because the effect of insufficient penetration is proportionately greater with light than with heavy sheet, care should be taken by the welding operator to attain full penetration with sheet metal. The margin between correct and excessive heat is relatively slight in welding light sheet, and the endeavor to weld through to the underside of the sheet should, therefore, be regulated so that molten metal will not be lost through the bottom of the weld.

In addition to fulfilling strength requirements, thorough penetration is often desired to give assurance that crevices of all kinds will either be minimized or eliminated in the underside of the weld. If the penetration extends through the entire thickness of the sheet for the full length of the seam, grinding or filing will remove most, if not all, of the irregularities or crevices.

### Crevices Eliminated

In many cases the elimination of crevices is as important a requirement as the attainment of maximum

(*Continued on page* 110)



# Standing Seam, 10 oz., Copper Roof on a Residence in the Southwest

COPPER salesman Harry H. Stephenson, has recently completed a new home in Dallas, Texas. The feature he is most proud of, naturally, is the 10-ounce copper, standing seam roof—"Cottage" type.

The sheet metal contractor who laid this show example is the AAA Sheet Metal Works, Dallas. The architect was Frank B. Kean and the general contractor Robert B. Slaughter, both of Dallas.

### Growing Popularity of Metal

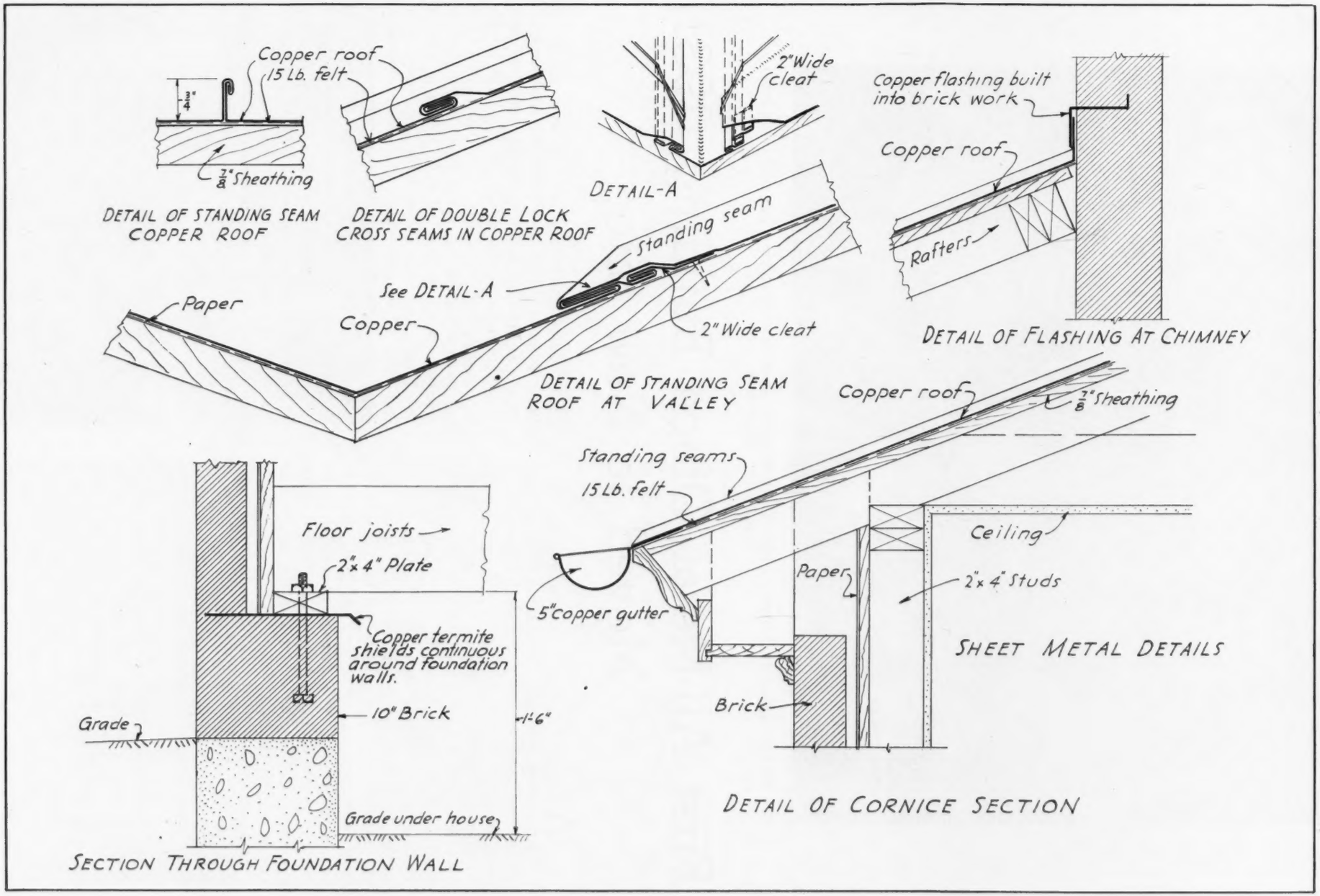
In submitting the photograph and detail sketch, Mr. Stephenson says that there have been quite a few roofs of this type laid in various Texas cities; that a growing number of Texas architects are showing an increasing interest in the design characteristics of this type of roof. Interesting, too, is the fact that whereas sheet metal work was practically eliminated on residences (especially small homes) during the past few years, today a growing number of progressive Texas sheet metal contractors, who do not care to or cannot go after the very large contract work, are beginning to push these 10-ounce copper roofs as a means of breaking into the residential market and increasing the percentage of total cost allotted to the metal contractor.

Of the several "talking points" for copper, architectural appearance (different from ordinary roofs), a reduction of 25 cents per hundred dollars in fire insurance and long life without maintenance seem to appeal most to owners and architects.

Mr. Stephenson's house is one-story as shown in the photograph and the dominating architectural feature seems to be the long, strong lines of the standing seams. The house has five rooms and a sun porch and the ground area is approximately 1420 square feet. The total cost of the house was $5,600 which does not include the cost of the lot and landscaping, but does include architect's fee.

The roof required 17 net squares of 10-ounce copper—1360 pounds gross. The sheets used were 16 inches wide and 72 inches long. The valleys, gutters, termite shields required another 350 pounds of 16-ounce copper applied as shown in the details.

The group of details shows the application of the copper. Construction follows accepted practice, as can be seen from the drawing. The termite shields may not be familiar to all readers. One detail shows the application of 16-ounce copper as a turned-down and projecting plate laid continuously all around the building at the top of the foundation and below all wood material. Termites eat wood, and come from the ground so by having no wood below the shield and making the sharp projection beyond the foundation these ants are kept out of the building.


Copper roof
15 Lb. felt
4"
7/8" Sheathing
DETAIL OF STANDING SEAM COPPER ROOF
DETAIL OF DOUBLE LOCK CROSS SEAMS IN COPPER ROOF
2" Wide cleat
DETAIL-A
Copper flashing built into brick work
Copper roof
Rafters
DETAIL OF FLASHING AT CHIMNEY
Standing seam
See DETAIL-A
Paper
Copper
2" Wide cleat
DETAIL OF STANDING SEAM ROOF AT VALLEY
Copper roof
7/8" Sheathing
Standing seams
15 Lb. felt
Ceiling
Paper
2"x 4" Studs
5" copper gutter
Brick
SHEET METAL DETAILS
Floor joists
2"x 4" Plate
Copper termite shields continuous around foundation walls.
10" Brick
1'-6"
Grade
Grade under house
SECTION THROUGH FOUNDATION WALL
DETAIL OF CORNICE SECTION

**The building "on its way," partly turned. The new site is across from the governor's mansion (white building, center foreground).**

# First All-Metal Office Building (1931) Moved to New Site

ANTICIPATED as a probability at the time of erection seven years ago, the all-metal office building of the Department of Public Works, Richmond, Virginia, described in the April 11, 1932 issue of the AMERICAN ARTISAN, has recently been moved 400 ft., from the corner of Twelfth and Broad Streets to a new location on Governor Street, in order that the new building of the Virginia State Library can be erected on the Broad Street site. The relatively narrow passage through which the building had to pass necessitated twice swinging through an arc of 45 degrees: once before the first forward movement could be made, and the second sandwiched in between two forward movements, each in the direction of the longitudinal axis of the building.

The contract price for moving the building was $30,900. Allen J. Saville, Inc., Richmond, was the general contractor, with B. F. Goodwin & Son, Marblehead, Massachusetts, the subcontractor doing the actual moving.

The contract time for moving the building was 60 calendar days from date of award of contract, during which time the building was maintained in a livable condition with all service facilities, including heat, light, telephone, water and sewerage, without interruption to the routine work of the Department or its accessibility to the public.

At the time the building was erected in the fall of 1931, seventeen propositions were considered for housing the Department of Public Works, which had been forced to vacate its quarters in the City Hall because of crowded conditions there. When bids were asked on the all-metal building, it was found that it could be erected on the city-owned lot at the corner of Twelfth and Broad Streets for less than the Department could rent space in near-by office buildings or rehabilitate other city-owned buildings less conveniently located. As early as 1931, it was known that the Broad Street lot would sooner or later be used for a public building of monumental proportions, and in designing the Public Works building, due consideration was given to the ease with which it could be torn down and re-erected with a minimum wastage of material or moved intact a relatively short distance; hence the adaptation of metal throughout the building.

Above the first floor, metal predominates on both exterior and interior surfaces, the basement being of masonry construction. The inner and outer walls are of aluminum. In the outer walls, plate and extruded shapes are employed to produce a drop-panel effect in the pilasters and entablature. The inner walls, as well as the partitions and doors, are formed from aluminum sheet. The casement windows are steel.

The entire structure is assembled on a structural

steel framework, the weight of the structure being materially reduced as a result of the aluminum curtain walls and steel floor and roof decking. Below the first floor level, the columns, which are spaced 16 ft. 6 in. both crosswise and lengthwise and are supported on concrete footings, are 8 by 8 in., 31-lb. H-sections; above this point, 6 by 6-in., 20-lb. H-sections. Twelve-inch channels and I-beams are employed for floor girders and 10-in. channels and I-beams for the roof girders. Both the floor and roof girders tie the columns together crosswise, the only longitudinal support being the 5 by 5-in., 18.9-lb. H-section girts above and below the windows, and the lattic-type joists.

Because of the relatively light weight of the building, it was decided to move the unreinforced concrete basement walls with the building, in order to lower the center of gravity and to obtain additional longitudinal stiffening of the structure. The columns were unbolted from the concrete footings, holes were cut in the basement walls below the window line for timber grillage, and after underpinning the structural framework, the basement walls were cracked at the top of the footing course. The Governor Street lot is 15 ft. lower than the Broad Street site, the maximum grade encountered in the path of travel being 8 per cent. As a result, it was necessary to maintain cribbing at the forward end of the track materially higher than that maintained at the rear as the building was turned and rolled to its new location.

**TABLE 1—TOTAL ANNUAL COST OF ALL-METAL BUILDING, DEPARTMENT OF PUBLIC WORKS, RICHMOND, VIRGINIA (1932-1938 Inclusive)**

| | |
|---|---|
| **All-Metal Office Building—** | |
| **Capital outlay for buildings and appurtenances ($50,117.59) reduced to an annual cost. Amortization period 7 years; interest rate 4¼%** | **$ 8,429.78** |
| **Additions and Betterments—** | |
| **(Annual average—7 years)** | **455.63** |
| **Watchman and Janitor Service, Supplies—** | |
| **(Annual average—7 years)** | **2,494.86** |
| **Gas (Fuel), Water, and Electric Service—** | |
| **(Annual average—7 years)** | **3,330.17** |
| **Repairs—** | |
| **(Annual average—7 years)** | **177.45** |
| | **$14,887.89** |

The original cost of the building, including all appurtenances, was $50,117.59, or about 22½ cents per cu. ft. Experience has proved this cost to have been well justified.

As indicated in Table 1, the actual annual cost, including allowance for interest on and amortization of capital outlay within the actual period of occupancy on its original site, additions and betterments, janitor service, gas, light and water, and repairs, has amounted to $14,887.89. Since the building has a net office floor area of 12,500 sq. ft., this represents a yearly cost of $1.19 per sq. ft., while at the time of erection, rental propositions ranged from $1.50 in a sprinklered mill-type building to $2.25 in a modern office building.

The annual cost of repairs has been exceptionally low, as a result of the extensive use of aluminum in both interior and exterior wall construction. The $177.45 item includes only the cost of repainting the window sash and water-proofing the basement walls.

The City of Richmond contemplates the ultimate erection of a municipal office building of sufficient proportions to accommodate all administrative offices, but just when such a building will materialize and be

(*Continued on page* 112)

**Above—Building shored, ready to move. Left —Carrying timbers were cut through the concrete foundation. Below—The building was pulled by power winches on trucks.**

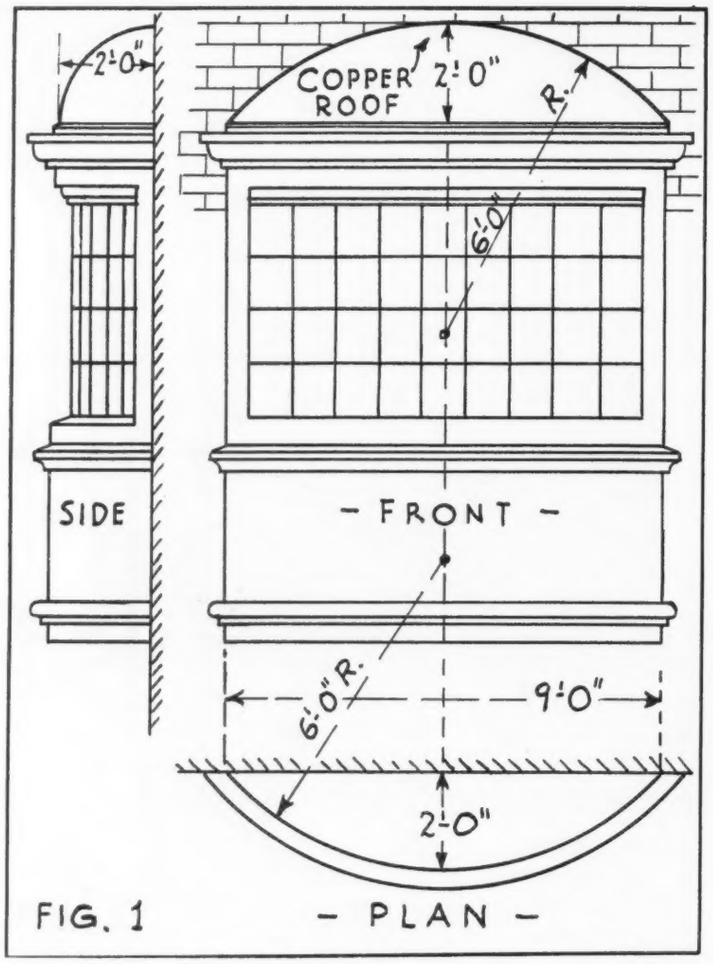


FIG. 1

# Pattern for a Metal Covered Bay Window Roof*

By William Neubecker
Head Instructor
Sheet Metal Department, New York Trade School

**Mr. Neubecker has developed two patterns for the reader. The short "gore" method is presented here. A longer method, requiring more material, and known as the "segment method" will be published in a later issue.**

A CORRESPONDENT from Rhode Island has sent in the following request.

"Inclosed please find a rough sketch of a bay window roof with fixed sash. This roof is to be covered with 16-ounce leaded soft copper. As you will see there is a side view, front view and plan, all measurements taken from the architect's blueprint.

"This bay window has a 9-foot opening with a curve on front view with a 6-foot radius. The rise in side view should be 24 inches. My problem is how to get out the segment patterns to cover this roof using lap seams, as the architect wishes it to look as near one piece as possible. Also, do these segments need raising to conform with the shape of the roof? In other words, this roof, in looking down on it, resembles ⅛ of an orange peel. I would appreciate it very much if you could assist me in getting out this pattern.

"I would also appreciate a shorter method different than 'segment' patterns; also, could the roof be put on 'batten' style using small battens?" In the writers opinion the use of battens on so small a dome would look too clumsy and would be impractical because every batten would have a different profile as it neared the end.

### Short Rule by Means of "Gores"

If a short rule is desired, a gore shaped pattern can be developed using but one pattern for *all* gores. These patterns when made up will give the dome roof an appearance of a one-quarter foot ball, with seams converging to the apex at the end of the dome as shown in Fig. 2. If segment patterns are employed, all seams will show horizontally the same as the joint lines in brick or stone work, and is probably what the architect wants.

In Fig. 1 is a finished reproduction of the bay window in question reproduced from the architect's small scale blue print with full size dimensions and radii.

Fig. 2 shows how the gore section is laid out, this being the simplified rule above referred to. A one-half elevation of the bay window roof is shown 4 ft. 6 in. long. The curve of the roof is struck with a 6-foot radius, similar radius being used for the curve in plan. The projection and height of the dome is 2 feet which makes the section of the dome on the line A-B in elevation a quarter circle as shown to the left of the elevation. This quadrant has been divided into five divisions or gores which can be "raised" if desired. It should be understood that if more gores are used the section will be nearer to a true quadrant.

Having decided upon the number of gores (in this case five) divide the quadrant into five divisions as shown by the small figures 1 to *6*. From *2* draw the seam line to *V*. Then will 1-*2*-*V* show one gore piece which will be similar to the other four.

Now divide the outer curve in plan into equal divisions as shown from *7* to *13*, from which points erect vertical lines to intersect the baseline 1-*V* in section as shown. Draw a line in the section from 1 to *2* and from the divisions obtained on the base line 1-*V*, draw lines parallel to 1-*2* until they intersect the gore line *2*-*V* as shown. Bisect the plane 1-*2* in section and obtain point *X* and draw the center line from *X* to *V* as shown.

Now take the girth from *7* to *13* in plan and set it

*All rights reserved.

# SIMPLIFIED METHOD FOR DEVELOPING GORE PATTERN FOR COVERING DOME ROOF OVER CIRCULAR BAY WINDOW — USING ONE PATTERN — FOR ALL GORES — No. 1 -

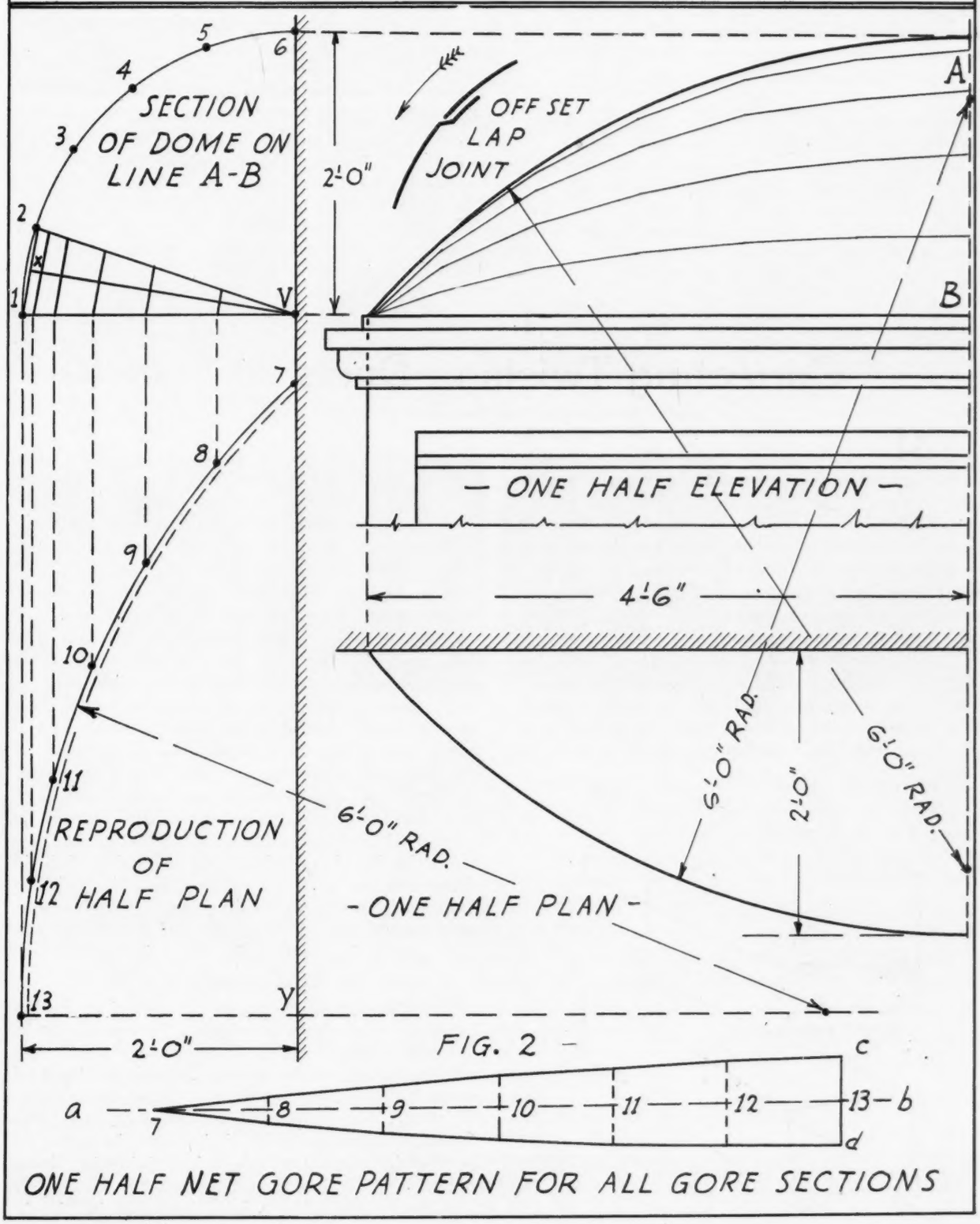



FIG. 2 -




ONE HALF NET GORE PATTERN FOR ALL GORE SECTIONS

off on the line *a-b* shown below as indicated by similar numbers. Through these points *8* to *13* draw lines at right angles to *a-b* as shown. Now measuring in each and every instance from the center line *X-V* in section of dome, take the various projections to either line 1-*V* or *2-V* and set them off in the pattern measuring in each and every instance from the line *a-b* in the pattern. Through points so obtained trace the curves *7-c* and *7-d*. Then will *7-c-d* be the one half net pattern for the gore strip with a seam along the center *A-B* in elevation. This one half pattern can be used for *all* gore sections, required to cover the dome.

Lap should be allowed along *7-c* in the pattern as indicated in the "OFFSET LAP JOINT" shown above the elevation. This offset is made by running the lap through the burring machine. Before assembling the various gores, the seams should be tinned on the inside to allow "sweating" when soldering. As the dome is only 9 feet long this work can be made complete in the shop, the joints or seams scraped clean and smooth, after which it can be secured to the framing of the bay window and securely flashed to the brick work. When the job is completed, it should be rubbed down with cotton waste saturated with boiled linseed oil which will give it a dark brown color.

The converging seam lines shown in elevation indicate how the seams would appear when viewed from the front. If the dome is to be true to a quarter circle, then the gores must be raised on the block, as much as is indicated by the slight depth between the gore line 1-*2* in dome section and the curved outline.

It should be understood, as a point in accuracy, that *Y-13-7* in the half plan is the true half section on the line 1-*V* in the dome section. A true section on the line *X-V* would be slightly smaller, or the difference between *X-V* and 1-*V* as indicated by the space between *X* and the curved line. This would make the radius for this curve in plan that much smaller as shown by the dotted curved line in plan, from which the girth would be taken. The increase in girth between the solid curved line *7-13* and the dotted curved line is so small that the girth of *7-13* can be used for all practical work.

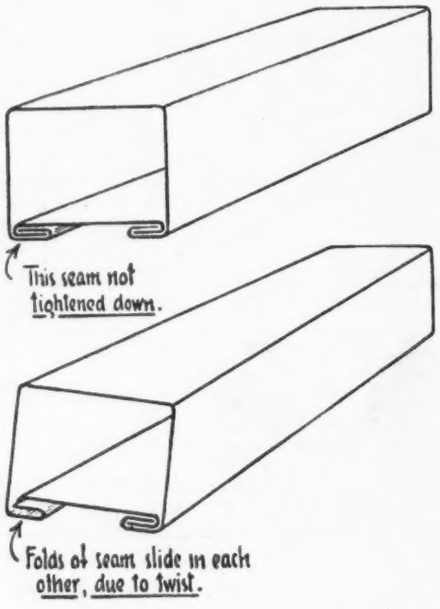
# Correcting Twists in Ducts

By A. Don

*(Reprinted from Sheet Metal Industries for April,* 1939)

MOST sheet metal craftsmen can testify from experience that in making a square or rectangular duct, there is a strong tendency to develop an undesirable twist, which prevents it from lying flat against a wall or a ceiling. When this happens, it is often followed by erroneous and unsuccessful attempts to correct it. The craftsman is generally puzzled as to how the twist got there, and is equally nonplussed as to how to remove it.

Usually the first attempt is to twist it back by applying a turning force in the opposite direction; but, if the seams are tightened or rigidly joined, this cannot be done without buckling the sides of the duct. Generally, the last expedient resorted to is to break open one of the seams and readjust it so that the twist disappears. This treatment should be applied in the first instance, since it is the only way to rectify satisfactorily a fault of this kind.



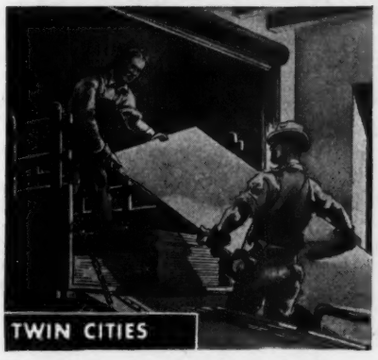

A good deal of useful information may be gleaned from a small model duct, about 2 in. square and 7 or 8 in. long, made of very thin tinplate, as shown in the cross section at Fig. 1. If the corners are knocked up, or double seamed, and one seam only not tightened down so that it is left just loose enough to allow the folds of the seam to slide in each other, it will be found that this model duct can be easily twisted either way by a turn of the hand, and straightened again. In the process of twisting and straightening, the folds of the loose grooved seam slide forward and backward in each other, and it should be noted that any attempt to prevent this sliding motion taking place, also prevents the duct from twisting or untwisting. A little demonstration with a model of this kind will be sufficiently convincing to show that the only reasonable method of correcting a twisted duct is to break open one of the seams and readjust it.

### Cause of the Twist

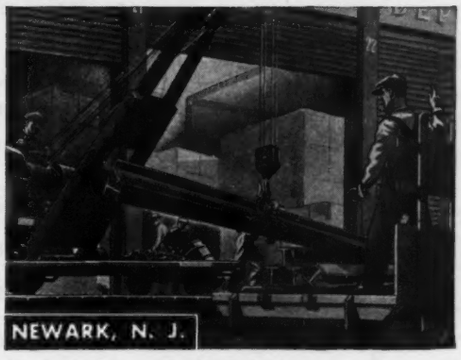
The cause of the twist in the first place is due either to inaccuracy in squaring the sheets, or in the subsequent bending of the corners not being quite parallel to the edges. Sometimes, both of these discrepancies contribute to the resulting twist. It should be quite obvious, however, that this trouble should not arise if due care be taken in setting the seams correctly before tightening down or finishing off, but faults such as this can be persistently troublesome unless the cause be clearly understood and caution exercised in avoiding it.

# 8 WAREHOUSES THAT *Rush* AS ONE!

"Urgent phone call received on holiday —goods shipped that same day."



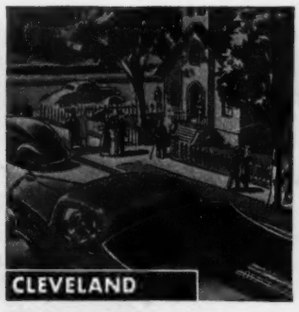

"Plates had to be cut to size—ordered 4:35 P.M.—shipped that night."



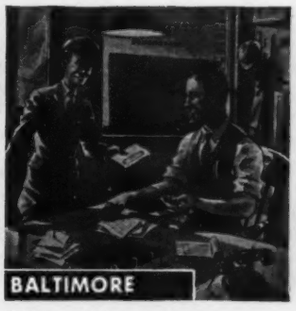

"Carload of beams for R. R. bridge ordered 2 P.M.—shipped at 4 P.M."

"Emergency for flood work— shipped in 3½ hours."

"Order received at 4 P.M.— shipped at 6 P.M."




"Order received Sunday— shipped same day."




"Must receive tomorrow morning." (They did)

"Delivered in 6 Hours."

USS Scully Service

IT'S the same story with each of the eight Scully Warehouses. They all operate on the principle that our customers always want their material shipped at once. Regular orders, special orders, rush orders—they all get Scully Service. (Of course, when you say "rush" we know you want extra prompt attention—and we act accordingly.)

Phone, write or wire the Scully warehouse nearest you. Each carries large stocks ready for immediate shipment. And ask for our complete Stock List and Reference Book. It's free, of course.

**When you re-tube boilers . . . remember Scully. Complete stocks to fit all requirements ready for instant shipment.**

## SCULLY STEEL PRODUCTS COMPANY

*Distributors of Steel, Steel Products, Copper and Brass*

*Warehouses at*

CHICAGO · NEWARK, N. J. · ST. LOUIS · BOSTON · ST. PAUL-MINNEAPOLIS
CLEVELAND · PITTSBURGH · BALTIMORE

## UNITED STATES STEEL

# Grab yourself a chair!

and pull up at the busiest conference on industrial advertising you ever heard of.

Two hundred controversial subjects will be discussed in clinics large and small. "How to improve your effectiveness as an advertising manager" will be one of the large clinics. The first day is Executive's Day (bring your boss).

Even at lunches you will be grouped with members and guests having identical interests.

Take advantage of low transportation rates, hotel accommodations at no increased cost and a guided tour of the industrial exhibits at the World's Fair with a day and a half left over to yourself! Make your hotel reservations early!

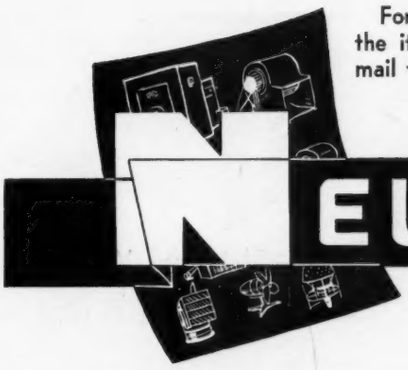
## Some of the Clinic Subjects

| | |
|---|---|
| FIELD WORK | PUBLICITY |
| PERFORMANCE DATA | MARKET DATA |
| DIRECT MAIL | MEASURING RESULTS |
| INDUSTRIAL EXHIBITS | CATALOGS |
| READERSHIP VALUES | SALES MANUALS |

TIE-UP WITH SALES FORCE

**EXHIBITS**
•
**AWARDS**
•
**LADIES' PROGRAM**
•
**DINNER AND SHOW AS USUAL**

**National Industrial Advertisers Association**
**100 East Ohio Street** **Chicago, Illinois**
2-39



For your convenience a number has been assigned each item. Circle the items in which you are interested on the coupon on page 102 and mail to us.

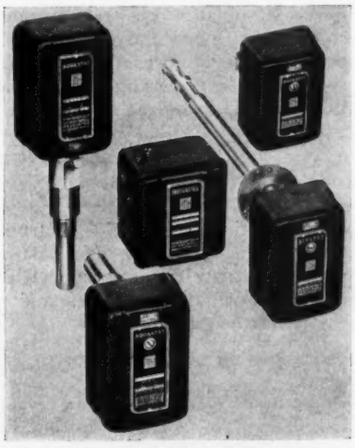
● Indicates product not listed in 1939 Directory.
△ Indicates product and manufacturer not listed in 1939 Directory.

# NEW PRODUCTS

## 130—Limit Controls

Minneapolis-Honeywell Regulator Company, 2950 Fourth Avenue South, Minneapolis is bringing out a new line of limit controls, including the Pressuretrols, Aquastats, Airstats and Furnacestats, styled by Henry Dreyfus to harmonize with modern plants.

The controls are small and compact with ample terminal spacing. Differential adjustment is simple, scales are visible and the differential adjustment is placed underneath the cover. Bi-metal is used in all temperature actuated controls.



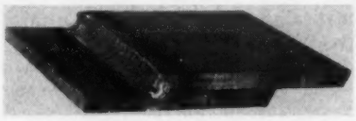
The ball and socket and stem of the furnace controls have been radically reduced in size.

There is a new method of mounting the Surface Aquastat—pipe straps are concealed and the friction collar permits installation on vertical, horizontal or angle pipes.

◆

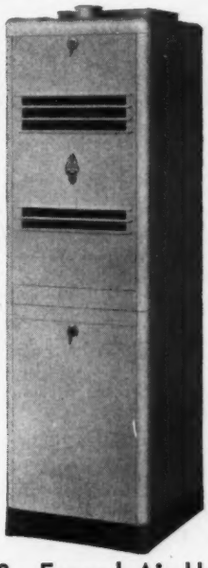
## ●131—Glyptal Gray

General Electric Company, Schenectady, New York, has developed Glyptal 1294 Gray to meet the need of fabricators for a material which, when applied to metal to be lap welded, would prevent corrosion at the point where the plates overlap. It also serves as a base for painting.



Glyptal Gray may be sprayed or brushed and the work may be left exposed to the atmosphere until fabrication is complete.

◆



## 132—Forced Air Unit

Payne Furnace & Supply Co., Inc., Beverly Hills, California, has designed an improved forced air unit for homes without basements. The new "Fau" is equipped with glass wool, replacement type filters. Installation is simplified by a more compact design that reduces the height of the new "Fau" by ten inches, and complete factory assembly in two separate sections. The unit can be installed in kitchen, closet or on the service porch. No basement is necessary. The round cornered casing is finished in a light desert tan.

An improved heating element increases heating efficiency. A large blower delivers air at slow speed with quiet operation. Quiet is further assured by mounting the blower and all moving parts on resilient rubber blocks. The long hour motor is also mounted on rubber.

The Payne "Fau" is available in four sizes with Btu input ratings from 60,000 to 160,000. It meets the latest A.G.A. approval requirements for use with natural or manufactured gas.

The "Fau" is also designed for use with liquid petroleum gas.

◆

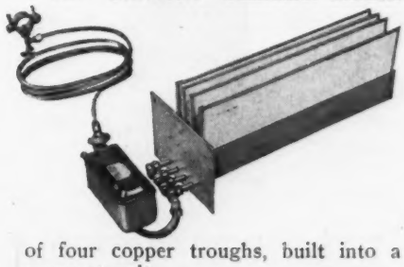
## ●133—Fireguard

The Ramey Mfg. Co., 243 N. 5th St., Columbus, Ohio, announces the Fireguard which opens and closes the furnace draft door without electric current.

## 134—Humidifying Equipment

Maid-O'-Mist, Inc., 180 N. Wacker Drive, Chicago, announces a new humidifying equipment for warm air heating plants known as the "Convector" humidifier.

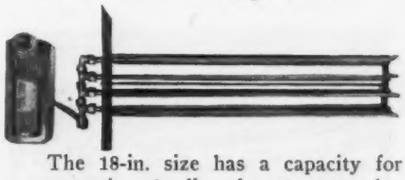
The "Convector" humidifier consists



of four copper troughs, built into a compact unit.

Due to the fact that the troughs are only ¼-in. wide, the flow of air through the plenum chamber is practically undisturbed or restricted. The total area of restriction to the flow of air is but 1 in., multiplied by the length of the humidifier, as listed above. Each humidifying trough is equipped with patented, metal edged, replaceable evaporators 6-in. high. These evaporators are fabricated from a special absorbent material, and are corrugated, with a water way between two walls to allow free capillary flow of water to the outside surfaces.

This patented humidifier only requires 1½ pints of water to fill the troughs in the smallest size and about 3 pints in the largest size. This limited volume of water offers almost flash action in continuous quick evaporation even at low temperatures.



The 18-in. size has a capacity for evaporating 25 lb. of water per day at a plenum chamber temperature of 130 deg. and up to 77 lb. per day at 230 deg. on gravity circulation. These capacities are increased about 25 percent where a blower is employed and 400 fpm. velocity is maintained.

The Water Feeder is built of brass, copper and monel metal, with all parts nickel plated. The valve seat has a renewable Neoprene washer. A large monel metal screen catches pipe scale. The valve is located above the water to avoid corrosion. The float lever of the feed valve is provided with a thumb screw adjustment to maintain the correct level to meet requirements.

# New Products . . . . . .

**For your convenience in obtaining information regarding these items, use coupon on page 102.**

## 135—Motorized Gas Valve

Minneapolis - Honeywell Regulator Company, 2950 Fourth Avenue South, Minneapolis, has just completed a new design of the V15 Motorized gas valve, to be known as the V155 model.

This new valve is equipped with a "Locking screw" which, when removed, will prevent the occurrence of a hazardous condition if the secondary air damper arm should bind and fail to close. In this event, a latch mechanism will allow the gas valve to close under the command of the thermostat, but will not allow it to open until the faulty damper is repaired.

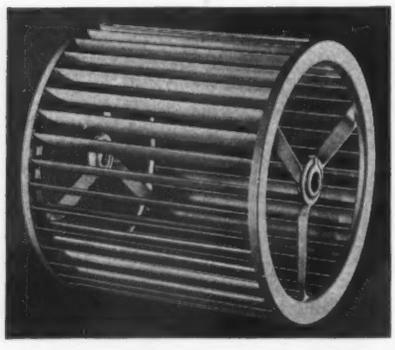
Sizes from ¾ to 2½ in. are available, and low voltage control wiring may be used. The valve is for use with AC current only and with gas pressures not exceeding 4 ounces.

◆

## ▲136—A. C. Blower

The Metal Stamping & Mfg. Co., 16816 Waterloo Road, Cleveland, announces a new blower for the heating and air conditioning industry.

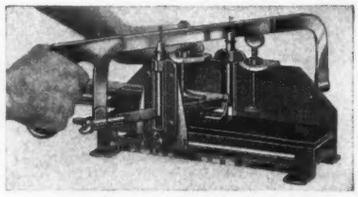
Blades are fabricated in one complete strip and assembled in the blower as an integral unit.



Rim, spokes and hub are made of one integral stamping to insure alignment. Rims are channel shape for strength with large radius to provide smooth flow of air. Spokes are formed at an angle to offer the minimum resistance to the inflow of air.

## 137—Metal Cutting Mitre

Stanley Tools, New Britain, Conn., announces a new metal cutting mitre box for installers of metal mouldings and trim. Its capacity is 2¼ in. high by 3 in. wide.



The box is all steel, light in weight, and has cast iron saw guides reinforced with steel. The saw guide posts are a new snap-on type which are ground to fit into the saw guides.

A hack saw frame with a 12 in. x 32 tooth quality steel saw is furnished with the box. A sliding front guide securely held in position by a clamp bolt and wing nut is used to obtain the different angles.

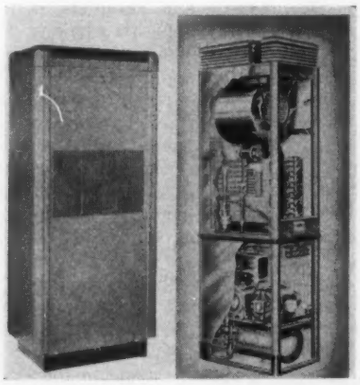
Two wood filler blocks furnished with the box will support a number of common shapes of moulding and trim.

The base, back and saw guides are lacquered blue, other parts are nickel plated.

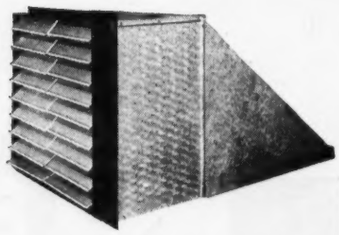
◆

## 138—Packaged Air Conditioner

General Electric Company, Schenectady, New York, announces new type units which provide cooling, filtering and dehumidification with complete automatic control, enclosed in golden bronze steel cabinets. With the addition of a heating coil and humidifier, they can be transformed into year-round conditioners. No duct work is required.



The units are suitable for restaurants, stores and small retail establishments, and completes a line of 1½, 2, 3, 5, 7½ and 10 hp sizes.



## 139—Flat Roof Ventilator

Viking Air Conditioning Corp., Main and Center Sts., N. W., Cleveland, announces the new Viking roof ventilator for installation on flat roofs.

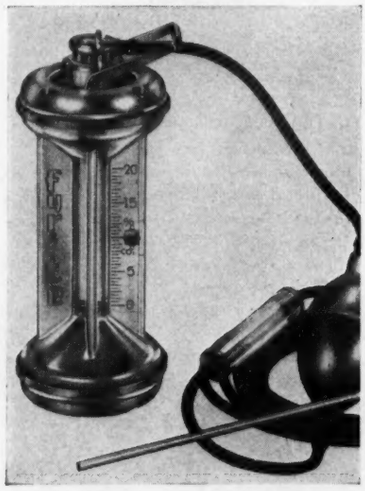
The Viking exhaust fan is enclosed in a weather-proof pent house of Armco galvanized iron, and is intended for exhausting hot air from stores, etc. It can be flashed directly to the roof slab, as flanges are provided. The roof ventilator is available in 3 sizes—7,500, 11,500 and 16,500 cfm.

The automatic vertical shutter consists of a set of balanced, light weight, hardened aluminum vanes supported by steel shafts pivoted in bronze bearings. These vanes are ganged together so that they open and close simultaneously. The vanes are held open by a spring and lever arrangement, as long as the fan is in operation.

◆

## 140—$CO_2$ Indicator

Bacharach Industrial Instrument Company, Pittsburgh, has just announced a new pocket-size $CO_2$ indicator, trade-named Fyrite, and designed for heating dealers.

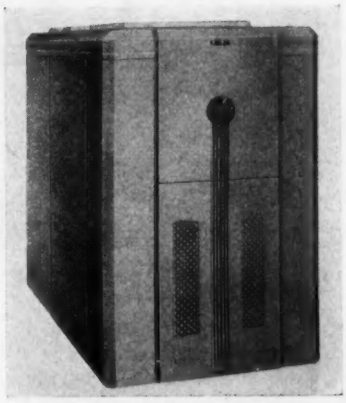


A dozen strokes of the aspirator bulb fills the Fyrite gas chamber with the flue gas to be analyzed. The sampling hose is then detached which automatically seals the Fyrite. To mix the gas the instrument is turned upside down and then back to its normal position. The suction created due to the absorption of the $CO_2$ pulls the absorbing fluid up in the graduated tube an amount equal to the $CO_2$ absorbed.

The instrument is furnished with aspirator bulb, filter, rubber tubing and metal sampling tube, packed in a case.

# New Products . . . . . .

**For your convenience in obtaining information regarding these items, use coupon on page 102.**



## 141—Winter A. C. Unit

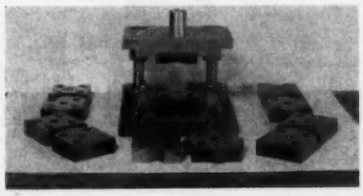
The Majestic Company, Huntington, Indiana, announces a new Majestic winter air conditioning unit, oil or gas-fired. The shell and dome are of $\frac{3}{16}$ in. boiler plate, the head is ¼-in. boiler plate and the super heater is constructed of heavy heat resisting steel. All seams of the fire chamber, furnace radiator and super heater radiator are electrically welded.

The unit consists of a primary heater and radiator, super-heater radiator, cabinet, controls, filters, blower, humidifier, oil burner and combustion chamber. Btu capacity at register is 90,000 to 120,000 for the No. 20, and 125,000 to 175,000 for the No. 21.

◆

## 142—Corner Radius Die

Service Machine Co., 164 Miller St., Elizabeth, N. J., has made an addition to the line of utility sheet metal dies. The new Utility corner radius trim-



ming die nips the sharp corners of square-sheared blanks, to provide round corners of the radius desired.

The regular radius blocks include ¼, ⅜, ½ and ⅝ radii on a four-way pair of blocks; ¾ and ⅞ radii and 1 and 1¼ in. radii on two pairs of two-way blocks. Sizes from 1½ to 2¾ in. radius are made on pairs of single blocks.

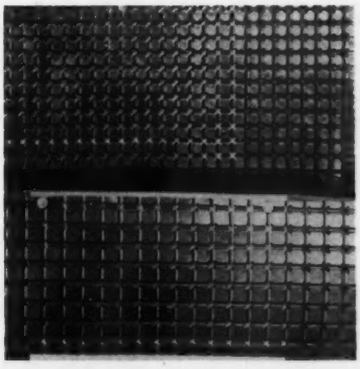
◆

## 143—Propeller Fan Blade

Torrington Manufacturing Company, Torrington, Conn., announces a new Pressure propeller fan blade. Designated as "P-Airistocrat," the line includes standard sizes—10, 12, 14 and 16 in.

## ▲144—Resilient Sheet

Leonid A. Dunajeff, 551 Fifth Avenue, New York City, has patented a resilient sheet—stretchable in any direction and which deflects elastically under load to a greater extent than an untreated sheet of the same material.

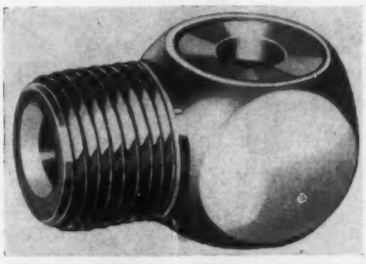


Metal sheets of high resiliency, such as carbon or alloy steel, bronze, etc., perforated so as to produce a mesh-like structure, are used. The perforations result in the formation of a plurality of interconnecting bridges, and these bridges are corrugated so as to form them into stretchable springs.

◆

## 145—Whirljet Simplex Nozzle

Spraying Systems Co., 4922 W. Grand Avenue, Chicago, has just placed on the market Whirljet Simplex spray nozzles available in ⅛, ¼ and ⅜



in. male pipe connection. Spray is the hollow cone type with uniform distribution. Capacities range from .1 to 2.5 g. p. h. at 10 pounds pressure.

◆

## 146—Stainless Electrode

The Lincoln Electric Company, 12818 Coit Road, Cleveland, announces a new arc welding electrode of the 18-8 type, having 3½ percent molybdenum, and designated "Stainweld C," providing weld metal of proper physical and chemical properties for welding stainless steels.

A coating is provided on the electrode which prevents oxidation of the weld metal and keeps the analysis of the deposited metal virtually the same.

Model HB-100 Blower - Humidistat Control

Model JR-40 Without Casing or Blower

## ▲147—Aqua-Sorber

Aqua-Sorb Company, 21 South 16th St., East Orange, N. J., has recently developed and placed on the market a de-humidifying unit known as the Aqua-Sorber, to overcome dampness and high humidity. The device is built in two models for different applications and price ranges.

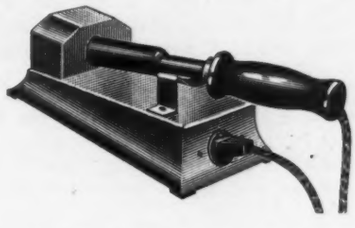
Model BH-100 consists of a metal cabinet 15 x 15 x 42 in. with a deep hinged cover. On the inside center top is mounted an electrically driven, direct connected, centrifugal blower, discharging vertically through a center opening. The blower, controlled by humidistat, draws moist air upward through the cabinet, which contains a lower filter bed of absorbent material, upon which is placed a 100 lb. charge of Aqua-Sorb to extract moisture from the air. The moisture absorbed forms a brine which flows downward through the filter bed, picking up more moisture and becoming progressively diluted until finally discharged into a drip-pan or drain connection.

The Junior Model, containing 40 lbs. of Aqua-Sorb and filter bed, is ordinarily operated without blower or humidistat, but can be equipped with either or both.

◆

## 148—Improved Control Stand

Electric Soldering Iron Co., Inc., Deep River, Conn., announces an improvement in their electric control

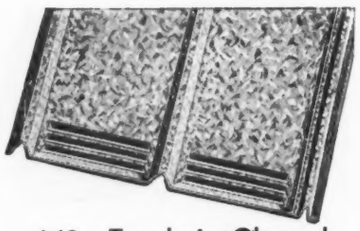


stand, which can now be used either on AC or DC current.

The Esico thermostat control stand is designed for any make of electric soldering iron and cuts the iron in and out of the circuit at any selected temperature required.

# New Products . . . . . .

**For your convenience in obtaining information regarding these items, use coupon on page 102.**



## 149—Twodrain Channel Roofing

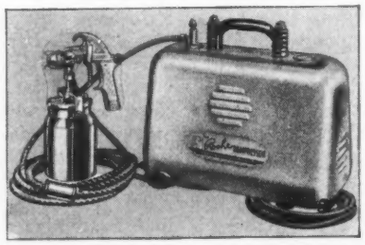
Milcor Steel Company, Milwaukee, Wisconsin, announces "Perfect Lap" Twodrain channel roofing for barns and granaries, which may be grounded to protect from electrical storms.

The roofing is made of steel, rust-resistant and heavily coated with zinc, and has 24-inch coverage. It is made in standard lengths— 5, 6, 7, 8, 9, 10, 11 and 12 feet of 29, 28 and 26 gauge material.

◆

## 150—Portable Paint Sprayer

Binks Mfg. Co., 3124 Carroll Ave., Chicago, has designed and developed the new Roche line of paint spray equipment, with a forced draft cooling principle. Two fans set up a suc-



tion and blowing system within an enclosed metal case.

The compressor is about the size of a portable electric sewing machine and powered with a G-E motor for either AC or DC current. The overall weight is around 40 pounds. The case is of heavy-gauge steel.

◆

## 151—Fiberglas Dust-Stop Filter

Owens-Corning Fiberglas Corporation, Toledo, Ohio, is introducing a new type Dust-Stop air filter for industrial and commercial use, utilizing fiberglas.

The new filter is 1 in. thick and is to be used with one or more like filters in series. It is an adhesive coated, impingement type of filter, non-cleanable and designed to be replaced when filled with dust.

Two mats are used—the coarse fibers of from .009 to .011 in. in diameter being at the intake face and the finer fibers of from .005 to .006 in. in diameter being at the discharge face. The fine fiber mat accounts for approximately two-thirds of the bulk of the complete pack. Long fibers are used. After spraying with a binder and drying, the semi-rigid mat is subjected to the application of an adhesive to catch dust.

The filter is faced with stamped metal grill and is bound on the edges with a special fiberboard frame.

◆

## ●152—Gas Tempered-Aire

Gar Wood Industries, Inc., 7924 Riopelle Ave., Detroit, announces the new Gar Wood model 80 gas-fired Tempered-Aire winter automatic heat-

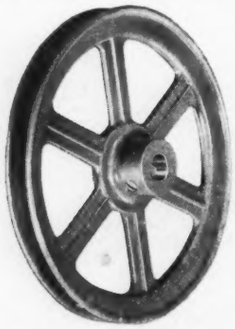
ing and air conditioning unit, designed for small homes. The unit heats, humidifies, filters and circulates the air in winter and provides air filtering and power-blower, comfort-cooling effect in summer.

Mechanism consists of a teardrop firebox, fuel economizer, steam-type humidifier, air filters and silent, multiple-vane power blower. Btu output is 100,000 per hour.

◆

## 153—Pulleys Redesigned

Congress Tool and Die Company, 9030 Lumpkin Avenue, Detroit, announces that the complete line of Con-



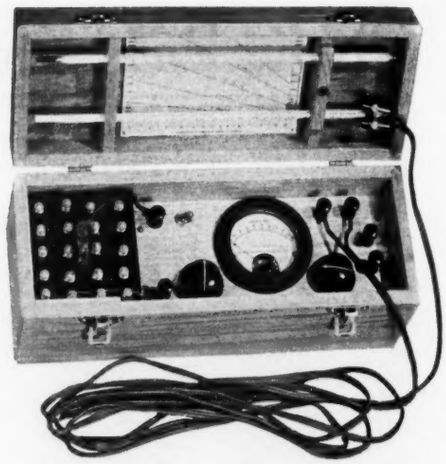
gress pulleys has been redesigned. A heavy bead has been added to the outside rim of the V-belt pulleys, to increase the tensile strength and insure truer running.

◆

## ▲154—Ash Receiver

Bressler Metal Works, Lebanon, Pa., announces a fabricated all-steel ash receiver ready for installation under the furnace, either hand or stoker fired.

The Bressler ash receiver is constructed of No. 12 gauge steel, welded watertight, has lid equipped with butt hinges and drop handle, and holds the 1¼-bushel ash can, size 12x19 in.



## 155—Thermo-Anemometer

Julien P. Friez & Sons, 4 N. Central Ave., Baltimore, announces the Thermo-Anemometer, an electrical instrument for the measurement of air velocities over a range of from 10 to 6000 fpm. and suitable for use in air temperatures of from 0 to 120 deg. F.

The instrument is housed in an oak carrying case and weighs 7 lbs. complete with battery.

◆

## 156—Water-Boy Feed Valve

Maid-O'-Mist, Inc., 180 N. Wacker Drive, Chicago, has placed on the market a new Water-boy feed valve with adjustable water line. The unit is built of brass, copper, Monel and Nickel silver and the float operating water feeder is housed in a nickel plated brass reservoir 2¼x2¼x6 in., provided with removable cover. The lower opening or feed outlet which connects to humidifier is fitted with a ⅜ in o. d. copper tubing connector and 2 ft. of ⅜ in. o. d. copper tubing, permitting the locating of the feeder away from the heat.

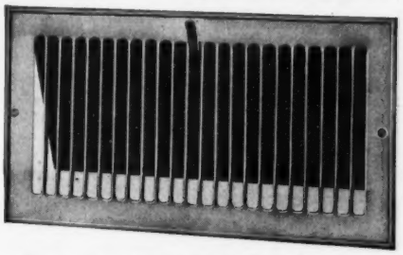
The supply valve is fastened by two locknuts to a support arm which may be raised or lowered in the reservoir by loosening a set screw. This permits adjustment of the water line in the humidifier to conform to city water pressure. Supply valve has a nickel silver valve body and raised seat. Valve pin is made of nickel plated brass with a heat-resisting rubber tip fastened in place. Levers and bearings are Monel metal. Valve is controlled by a 1½ in. diameter by 2¼ in. copper float with nickel plated finish.

To protect the valve from scale and grit, a 1⅜ in. dia. 100 mesh Monel metal filter screen located in the main body of the valve is provided. The tail piece of the feeder is equipped with a ¼ in. o. d. copper tubing connector for attachment to water supply.

# ★ AIR CONDITIONING U.S. REGISTERS GIVE YOU GENUINE QUALITY For YOUR COMPLETE NEEDS IN THE LOWER PRICED CLASSES

## For Low-Cost *Forced-Air* Installation

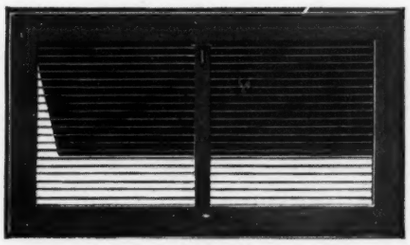
**Style 102**



When Non-Directional Flow will serve the purpose and economy is important, use Style 102. This is the quality **and the only Embossed Bar Design** in the lowest price level. Style 103 (Perforated—not embossed) is another Design in the Low Priced Group made in a vertical oblong lattice design.

## For *Directional Flow* Air Conditioning

**Style 153**



Here's the solution to the problem of good quality installations at competitive prices. U. S. Louver Type Registers (style 153 is typical) give you all directional flows and non-vision at exceptionally low cost. **Minimize number of styles by use of U. S. Inset Panels.**

With these popular registers there is complete interchangeability—in all styles—of Band Steel, Studding and Baseboard Frames.

## *Send for New POCKET MANUAL 27R*

**U. S. Registers are handled by leading jobbers and distributors of furnaces, registers, and heating supplies including the nation's largest manufacturers of warm air furnaces. Write for the new Pocket Manual No. 27R which shows you all the popular U. S. designs and sizes.**

***See important announcement in next issue.***

**UNITED STATES REGISTER CO.**

BATTLE CREEK, MICHIGAN

MINNEAPOLIS • KANSAS CITY • ALBANY

SAN FRANCISCO • NEW YORK, N. Y.



# A NEW BLOWER WHEEL BY TORRINGTON

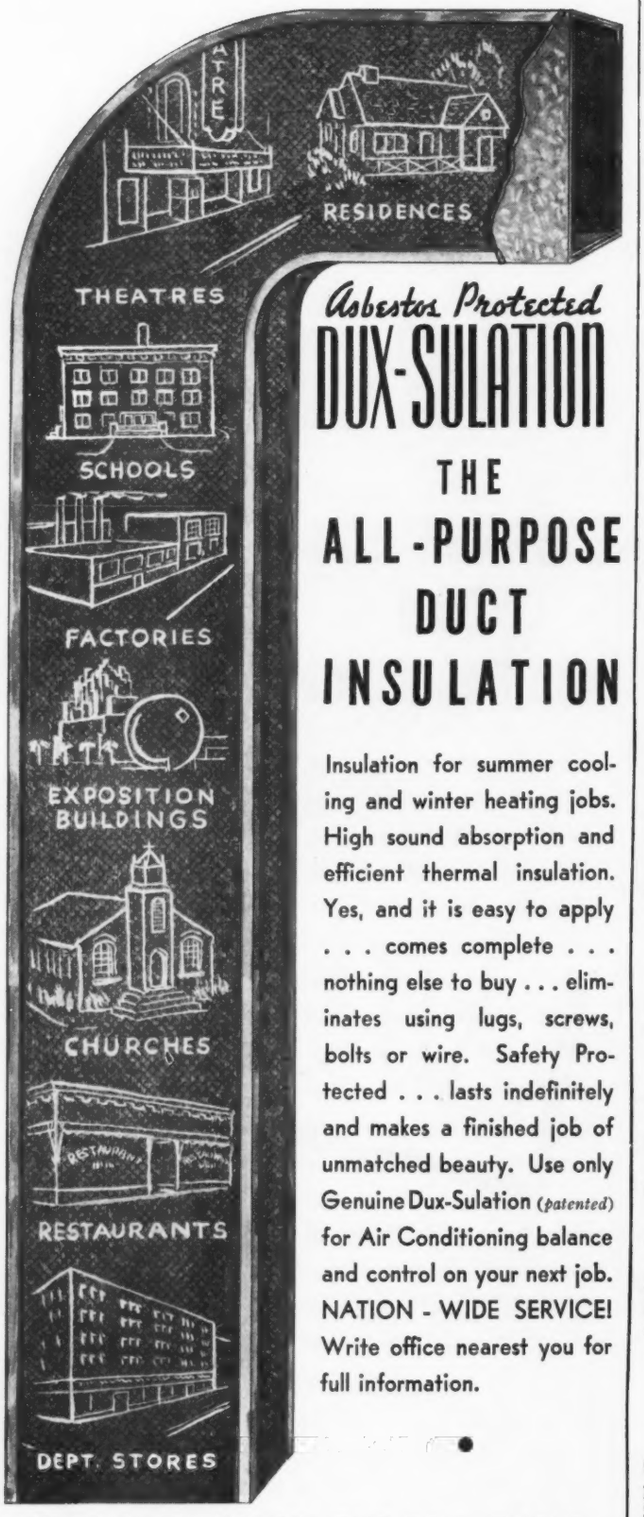
## FOR WARM AIR FURNACES

**PROBLEM:** Required, a blower wheel for warm air furnace blowers and similar uses, lighter in weight yet sturdy, simply designed without rivets, quieter, smoother in operation and *reasonably priced.*

**ANSWER:** Torrington AIROTOR Blower Wheels. Application of sound principles of design and construction by experienced Torrington engineers *plus* thorough, rigid laboratory tests has resulted in the perfection of a new, patented double-width, double-inlet blower wheel that meets every requirement and assures dependable performance.

AIROTOR Blower Wheels (steel with aluminum lacquer finish) are available in sizes 12″ x 12″ and 16″ x 16″. A third size, 20″ x 20″, will be added. Write for bulletin giving wheel dimensions, performance ratings and housing scroll designs. Ask, too, for information on the full line of Torrington Blower Wheels. Address Department K—

**The Torrington Mfg. Co.**
**Torrington - Conn. U.S.A.**




*Asbestos Protected*

DUX-SULATION

THE ALL-PURPOSE DUCT INSULATION

Insulation for summer cooling and winter heating jobs. High sound absorption and efficient thermal insulation. Yes, and it is easy to apply . . . comes complete . . . nothing else to buy . . . eliminates using lugs, screws, bolts or wire. Safety Protected . . . lasts indefinitely and makes a finished job of unmatched beauty. Use only Genuine Dux-Sulation *(patented)* for Air Conditioning balance and control on your next job. NATION - WIDE SERVICE! Write office nearest you for full information.

**GRANT WILSON, INC.**
4101 West Taylor Street — CHICAGO

**PLANT RUBBER & ASBESTOS WORKS**
537 Brannan Street — SAN FRANCISCO

**AIR CONDITIONING UTILITIES CO.**
8 West 40th Street — NEW YORK

**ATLAS ASBESTOS CO., LTD.**
110 McGill St. — MONTREAL, CANADA

# Association Activities . .

## National Secretaries' Conference

The National Secretaries' Conference, representing air conditioning, ventilation and heating, sheet metal and roofing work and allied industries, is receiving such favorable replies to a recent questionnaire regarding the continuance of their activities that they have decided to hold the next conference in Milwaukee, Wisconsin, on Saturday, September 19, 1939, at the Plankinton Hotel.

This will be a one-day session and the principal matter up for consideration and discussion will be the formation of a National organization. Other problems will be under consideration and discussion during the sessions.

The Secretaries' Conferences have been held at intervals of approximately sixty days during the past three years and some things have been accomplished for those in the industry. Considering the past performance of this group, suggestions were offered toward organizing a National association for the purpose of preserving, improving and protecting the industry, also reclaiming and getting back work that rightfully belongs and which has been lost through invasion of other crafts.

A prospectus code of regulation and by-laws appeared in American Artisan for June, page 34.

Paul L. Biersach, Secretary.

◆

## Philadelphia

The Association of Roofing, Metal & Heating Engineers of Philadelphia reports "Business slowed down for about one-half of our members and is good for the other half according to reports last week (July 28). Most of our fellows have 'caught up' and passed their overhead. It is quite a game among us and about twenty are 25 percent ahead and when the others hear that, they start working harder to catch up. One shop had 50 percent ahead."

B. F. John, Secretary.

◆

## Milwaukee

The Master Sheet Metal, Heating, Ventilating and Air Conditioning Contractors Association of Milwaukee, Inc., met on July 10—called to order by President Frank Kramer with 17 members present.

77 reservations were reported for the picnic and arrangements were completed. Two photo projectors, with Harry Yempal as operator, will provide two splendid movies to be run in the evening.

Bank nite drawing was in favor of member Fetting and $2.00 passed into his possession.

The Board of Directors met at Room "D," Republican Hotel, Milwaukee, the same day.

Reginald Roden, an old and valiant member, met his death through an automobile accident and resolutions were drafted and forwarded to the family and read at the general monthly meeting.

Paul L. Biersach, Secretary.

◆

## Illinois

Illinois State Travelers Division of Illinois Sheet Metal Contractors Association, 1313 S. Adams St., Peoria, has prepared and sent to the entire membership of the Illinois Sheet Metal Contractors Association and to a large number of prospective members a roster of the Illinois State Travelers Division.

The roster is a classified buyers' guide for 1939-1940.

E. A. Eichenberger, President.
E. H. Olsen, 1st Vice President.
A. C. McKinley.

◆

## Irvine Member NWAH & ACA

Jan S. Irvine, of Owens-Corning Fiberglas Corporation, Toledo, has been appointed a member of the Merchandising Committee of the National Warm Air Heating and Air Conditioning Association.

Randall One-Piece
Steel Housing
Pillow Block

*Not*

## because they're low in price but because they're *good!*

Thousands of these new Randall One-Piece Steel Housing Pillow Blocks are already in use. They cost less, they're light in weight, they're simple to assemble. But, most important, they eliminate noise and bearing trouble in the field.

Randall Pillow Blocks are durable, self-aligning and self-lubricating. They are today the result of a third of a century of bearing pioneering.

Randall also makes a complete line of graphite bronze bushings.

Write for complete catalog.

Representatives carrying stocks

TEK BEARING CO.
177 Lafayette
New York City

AMERICAN STOCK GEAR CO.
100 St. Clair Ave., N. W.
Cleveland, Ohio

C. W. MARWEDEL
San Francisco
California

**Randall GRAPHITE PRODUCTS CORP.**
Dept. 811 609 W. Lake St., Chicago, Ill.

## *Advanced features that make sales...*

With its time tested principles that have made the Rybolt furnace famous, Series 15 combines many new advanced features of strong selling appeal.

Among these are included the convenient feed section, with its large opening, effective smoke consuming device and tight closing door. Then there is the Rybolt one-piece radiator with long heat travel and new type clean-out cover, absolutely gas- and dust-tight. An unusual feature, too, is the efficiency and ease of operation provided by the extra large Rybolt duplex ball bearing grates which provide ample area for correct air volume and perfect combustion.

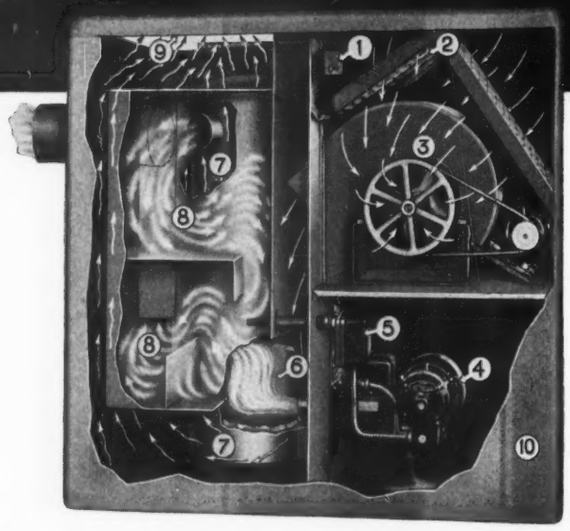
Rybolt Series 15 has everything needed to make sales and satisfied customers.

*Write for folder "The Furnace of Today"*

**THE RYBOLT HEATER CO.**
615 Miller Street · Ashland, Ohio

*Entirely New!*

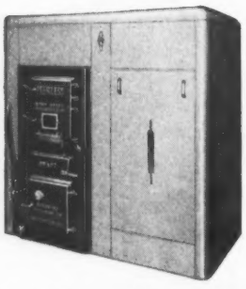
# PEERLESS "MASTER" —FOR OIL OR GAS

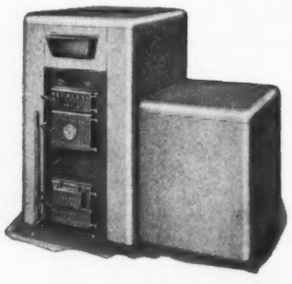



YOU'VE been waiting for this! Automatic heat for small and medium size homes their owners *can really afford*. All previous records of efficiency and fuel economy are knocked into the proverbial "cocked hat" by scientific designing and sound construction. Note the compact simplified arrangement of all the component parts and the intricate maze of baffling in the big radiator that delays passage of flue gas to the chimney.

With a **PEERLESS MASTER** even the most modest home can enjoy the luxuries of oil or gas heat.

Mail the coupon today for literature containing authentic reports of tests made with the new **PEERLESS "MASTER."** Get all the facts—including the sensationally low prices and liberal trade discounts. Here's an outfit you can sell to practically every prospect—and realize a handsome profit on every sale. Mail coupon for particulars.





Peerless builds everything in warm air heating equipment, from round furnaces to completely automatic winter air conditioners, using all types of fuel. All latest developments in appearance, finish and operation. Prices consistently lower than competition. Liberal profit margins for the trade. Write for proposition and prices.

**PEERLESS FOUNDRY COMPANY**
**INDIANAPOLIS, INDIANA**

**PEERLESS FOUNDRY COMPANY, 1853 Ludlow Ave., Indianapolis, Ind.**

Please send literature and prices on the new Peerless Master and other units in your complete line.

*Name*..... *Company*.....

*Address*.....


# With the Manufacturers . .

## Mercoid in Boston

The Boston office of The Mercoid Corporation is now located at 839 Beacon Street. Burt Power is in charge.

◆

## DeBothezat Moves to East Moline

R. W. Denman, Advertising Manager, DeBothezat Ventilating Equipment Division, American Machine and Metals, Inc., announces the transfer of the general sales offices from 100 Sixth Avenue, New York City, to East Moline, Illinois.

◆

## Alumaweld Changes Name

L. S. Johnson, General Manager, Alumaweld Company of America, announces that because of much wider diversity of products and the need for larger quarters, the company has changed its name and address to Lloyd S. Johnson Company, 2241 Indiana Avenue, Chicago—Phone Calumet 5033. There is no change in ownership or management.

◆

## J. S. Jones Pacific Coast Manager

W. V. Sullivan, vice president in charge of sales of American Machine and Metals, Inc., New York City, announces the appointment of Joseph S. Jones as manager of the Pacific Coast division, with central offices in San Francisco. Mr. Jones will have charge of DeBothezat Ventilating Equipment Division sales activities in the section from Montana, Wyoming, Utah and Arizona west to the coast.

◆

## Cooling School

The Premier Furnace Company, Dowagiac, Michigan, held their first cooling school at Dowagiac this spring. A two-day engineering discussion was conducted where

Premier dealers and field engineers attending cooling school, with a portion of the office force.

dealers were given complete details and instructions for estimating the average cooling load. The course covered water cooling, mechanical cooling and attic fan installations, how to size equipment, how to install it and how to sell it.

◆

## Stokol Dealer Meetings

The Schwitzer-Cummins Co., Indianapolis, Indiana, manufacturers of Stokol Hydraulic, Stokol-Mercury, and Stokol-Heat winter air conditioner, has completed a series of regional dealer meetings from Boston to Seattle and St. Paul to Birmingham. The meetings were conducted by Louis Schwitzer, president; Walter Sormane, sales manager; Leroy A. Kling, merchandising and promotion counsel; John Roland, chief engineer; W. R. Miller, Stokol control engineer; and Walter Greenhaugh, service engineer.

# Your Next Humidifier Installation May Be Worth *Hundreds of Dollars*

THERMO-DRIP FEATURES GIVE THE HOMEOWNER PLENTY TO TALK ABOUT. . . BRING MORE JOBS YOUR WAY

Neighbors' over-the-fence conferences . . . homeowner-conducted tours of visiting friends to basements . . . these are the things that make life worthwhile for you—if they're occasions when customers express satisfaction with your service and equipment. That's customer goodwill that generally starts the trek of other buyers to your shop . . . builds sales and profits for you!

THERMO-DRIP Humidifiers, more than any other kind of air moistener, get many such conferences and tours under way. Their heat-regulated drip feed principle measures up to the homeowner's idea of how a fully automatic humidifier should perform. He values the absence of gimcracks and gadgets because it means attention-free operation, and the omission of mechanical parts and floats gives him assurance of trouble-free performance.

Yes, this combination of features gives the homeowner in whose furnace you install the THERMO-DRIP plenty to talk about, but there's still another important feature that makes him realize you installed the last word in health and comfort promoting equipment—THERMO-DRIP is the stainless steel humidifier. That means longer life!

It costs no more to buy and install THERMO-DRIP Automatic Humidifiers, so don't let ordinary air moisteners deprive you of these goodwill-building, business-getting advantages.

*Ask Your Jobber or Write Us Today for Full Details*

**AUTOMATIC HUMIDIFIER CO.**
18th and MAIN STREETS CEDAR FALLS, IOWA

**THERMO-DRIP** *Automatic* **HUMIDIFIER**

# POLARIZED MAGNETIC

# ACTION THERMOSTAT

AN EXCLUSIVE FEATURE OF NEW, IMPROVED

# MASTER

## HEAT REGULATOR

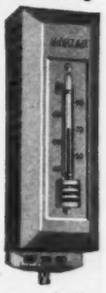
*NOW AT THE LOWEST PRICE IN HISTORY!*

★

At today's sensational low price, the new, improved Master Heat Regulator with the polarized magnetic snap action thermostat is setting the pace for the industry.

This revolutionary new principle in thermostat design guarantees: (1.) Quicker response to temperature changes; (2.) Positive contact; (3.) Longer life for contact points. All contacts are made of pure silver. An ingenious transparent shield protects them from dust and lint. Master Thermostats are adjusted at the factory to operate with a maximum temperature differential of only 1 degree.

The Master Damper Motor is the only 4-pole electric motor of the shaded induction type in its price class. Rugged. Powerful. Efficient. There are no commutators or brushes to cause radio interference. Double contact circuit-breakers assure positive performance at all times. Bearings are self-aligning and self-lubricating. Gears are extra heavy and will last a lifetime with normal service. A 14-gauge steel housing affords "battleship" protection for all moving parts. Basement switch is conveniently located.



The P-22 Master Heat Regulator is a complete packaged unit, consisting of a thermostat, damper motor, transformer, 30 feet of thermostat cable, damper chain, pulleys, insulated staples and mounting screws.

Use coupon to write for illustrated bulletin and amazing low price on the new, improved Master Heat Regulator.

The Master Heat Regulator is a product of the White Manufacturing Co., makers of scientific temperature controls for over 20 years.

*BUILT TO OUTLAST ANY HEATING PLANT* **MASTER** HEAT REGULATOR

**MAIL COUPON AT ONCE!**

WHITE MANUFACTURING CO. DEPT. (A.A.)
2362 UNIVERSITY AVENUE
ST. PAUL, MINNESOTA

PLEASE RUSH ME BULLETIN AND AMAZING LOW PRICE ON NEW IMPROVED MASTER HEAT REGULATOR.

NAME_____

ADDRESS_____

CITY_____ STATE_____

# With the Manufacturers . . .

## Son Succeeds C. U. Williams

C. U. Williams, for 21 years president of the Williams Oil-O-Matic Heating Corporation, Bloomington, Illinois, has retired and is succeeded by his son, W. W. Williams, who has served as vice-president during the company's entire life

◆

## G-E Advances Lord and Eckel

Manley E. Lord, since 1935 co-ordinator of all refrigerator manufacture for the General Electric Company, has been named assistant to W. R. Burrows, vice president in charge of manufacture.

Joseph F. Eckel has been appointed to succeed Mr. Lord.

◆

## Wayne Mendell With DeBothezat

DeBothezat Ventilating Equipment Division, American Machine and Metals, Inc., East Moline, Illinois, announces the appointment of Wayne Mendell to supervise sales activities in the Chicago area, with headquarters at 35 East Wacker Drive.

◆

## Poucher Joins Research Products

The Research Products Corporation, Madison, Wisconsin, has added Richard C. Poucher to its sales staff. Mr. Poucher will take charge of the sales engineering problems for the Air Filter Division in Ohio, Michigan, Pennsylvania and New York.

◆

## Crocker Manager A. C. Department

Charles E. Wilson, executive vice president of General Electric Company, announces the appointment of Stuart M. Crocker as manager of the air conditioning department, with headquarters in Bloomfield, N. J. Mr. Crocker has relinquished his duties as assistant to the executive vice president, but remains a vice president of the International General Electric Company.

◆

## Armco Consumer Advertising

The American Rolling Mill Company, Middletown, Ohio, has been advertising ARMCO Ingot Iron with the Armco triangle trademark since August 8, 1914. Armco Ingot Iron is a rust-resisting iron and helpful buying information is the advertising philosophy of the company.

◆

## M. F. Robbins, Jr., with Conco-Sampsel

Conco-Sampsel Stoker Corporation, Mendota, Illinois, announces the appointment of M. F. Robbins, Jr., as Eastern divisional manager. Mr. Robbins will be in charge of both sales and service for the complete Conco line of domestic and commercial coal stokers, oil-fired air conditioners and conversion oil burners.

◆

## Duitch Joins Delavan Engineering

Delavan Engineering Company, manufacturers' engineering sales representatives, 414 Twelfth Street, Des Moines, Iowa, announces the addition to its staff of sales engineers of Paul R. Duitch, graduate from Iowa State College in mechanical engineering.

The company has concluded arrangements to act as exclusive representatives for B. F. Sturtevant Company.

◆

## York in Newton Corner, Massachusetts

York Oil Burner Co., Inc., York, Pa., announces the appointment of the Lawrence-Draper Corporation as exclusive distributor of York oil burners and winter air conditioners, in Metropolitan Boston, Maine, New Hampshire, and Vermont, with a new and modern showroom at 71 Elmwood St., Newton Corner, Mass.

W. R. Lawrence is president and T. W. Draper is treasurer.

The HESS Line includes every type of Furnace to fill your requirements

The HESS FRANCHISE offers You—

One reliable source of supply with a background of 66 years of successful experience. The Hess line is complete, including welded steel furnaces up to one million B. t. u. capacity, blower filter units, oil burners, stokers, all accessories for complete installations. No job is too large or too small for Hess equipment.

Greater opportunities for sales because the Hess Furnace is distinctively different with more selling features than ordinary furnaces. It is rectangular throughout . . . not a round furnace with a square casing.

Real territory protection. No competition with other dealers in your vicinity selling the same item. Effective advertising materials, attractive consumer literature and successful sales plans, are furnished to Hess Dealers to help them secure prospects and orders.

HESS BLOWER FILTER FURNACE

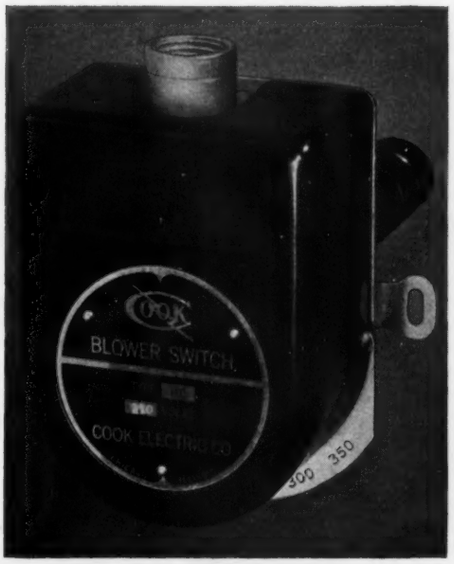
Modern forced air casing in galvanized or beautiful enamel finish. This combination of Hess Furnace and Blower Filter Unit gives complete winter air conditioning and summer benefits.

FREE! Dealer Portfolio Complete Details and Sales Helps

HESS WARMING AND VENTILATING CO. 1211-27 S. WESTERN AVE. CHICAGO, ILL.

Established 1873

# LOOK to COOK




## for WARM AIR FURNACE SWITCHES for FAN, BLOWER and LIMIT CONTROL

(Mercury Tube Type)

—that are engineered to give trouble-free, service-free performance.

—that are styled to look as good as they are.

—that are designed for easy installation as well as efficient operation.

—that you can sell with confidence they will make good every time.

—that you can sell in volume with a generous profit.

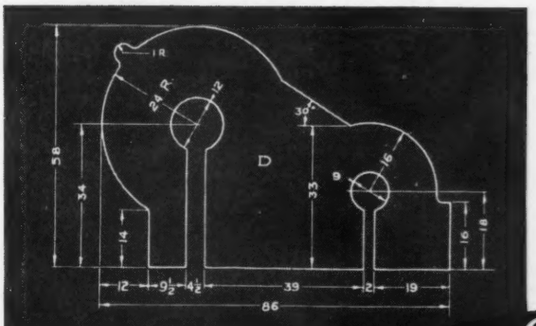
**So Look to Cook—and Write to Cook Today**

**COOK CONTROLS**

THERMOSTATS—FURNACE LIMIT CONTROLS
ZONE CONTROLS—BLOWER CONTROLS

**COOK ELECTRIC CO.**

**2678 Southport Ave.** **Chicago**



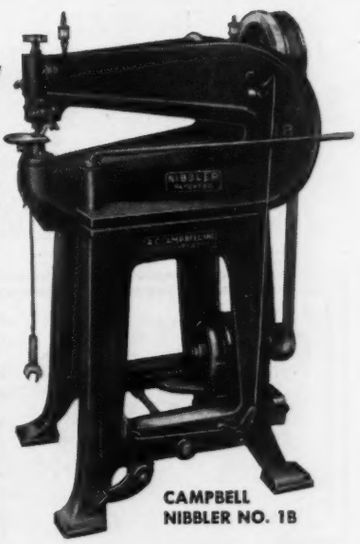

**389" OF CUTTING...**

***Can you cut it in 15 minutes?***

**THE**

# CAMPBELL NIBBLER

***does it with ease!***




**CAMPBELL NIBBLER NO. 1B**

● The cutting of 389 inches of sheet metal in 15 minutes is easy for the Campbell Nibbling Machine. This efficient machine frequently cuts irregular shapes in steel or other metal sheets up to half-inch thick in one-half to one-fifth the time required by other methods.

The Campbell Nibbling Machine leaves no burrs on the cut edges. Little if any finishing is required. The materials are not distorted. No strains or microscopic fractures are developed.

Write for the booklet describing the Campbell Nibbling Machine. It tells how this machine saves die costs on short runs and gives many other economies.

**BUY ACCO QUALITY** *in Campbell Cutting Machines, Wright Hoists, Page Welding Electrodes, American Welded and Weldless Chains, Tru-Lay Preformed Wire Rope, Reading-Pratt & Cady Valves and Page Wire Fence.*

**ANDREW C. CAMPBELL DIVISION**

DESIGNERS AND BUILDERS OF SPECIAL MACHINERY

**BRIDGEPORT, CONNECTICUT**

*See our exhibit, Metals Building, New York World's Fair*

ACCO TRADE MARK

**AMERICAN CHAIN & CABLE COMPANY, Inc.**

*In Business for Your Safety*

# With the Manufacturers . . .

## Jarvis Manager Oil Burner Division

Robinson Furnace Company, 213 W. Hubbard Street, Chicago, announces the appointment of Clarence A. Jarvis as manager of their Oil Burner Division.

◆

## Lehman Advertising Manager Viking

Viking Air Conditioning Corporation, Cleveland, announces the appointment of A. W. Lehman as manager of the advertising and sales promotion departments.

◆

## Bergquist Joins Airo Supply

Karl Bergquist, formerly manager of the refrigeration parts division of Borg-Warner, has joined the staff of Airo Supply Company, according to E. W. Scotten, Store Manager.

◆

## Joseph A. DeLo Promoted

Joseph A. DeLo, formerly assistant advertising manager, has been appointed sales promotion and advertising manager of the Continental Steel Corporation, Kokomo, Indiana.

◆

## David A. Hossler Dies

David A. Hossler, 69 years of age and for 41 years with the J. M. & L. A. Osborn Company, Cleveland, died suddenly on August 2 at his home. Mr. Hossler was widely known throughout the trade of northern Ohio.

◆

## Delco-Heat Sales Organization

Sale of all Delco-Heat products has again been placed under the management of the Delco Appliance Division, General Motors Sales Corporation, Rochester, N. Y., after having been handled through the Delco Frigidaire Conditioning Division, Dayton, Ohio, since January 1, 1936. The physical shift over to Rochester is now completed.

Heading the new sales organization is C. E. Lewis, formerly sales manager for Delco-Frigidaire. Advertising and sales promotion is under the direction of O. E. Wolf, who formerly occupied the same position with Delco-Frigidaire.

◆

## Ryerson Buys Philadelphia Plant

Joseph T. Ryerson & Son, Inc., Chicago, has purchased the Philadelphia plant property at 5200 Grays Avenue from the Taylor-Wharton Iron & Steel Company, formerly under lease. The Ryerson Company has extensive improvements and additions under way.

◆

## Conco-Sampsel Distributor Appointments

Conco-Sampsel Stoker Corporation of Mendota, Illinois, announces new distributors as follows:

The H. L. Bennett Industries of 511 Harrison, San Francisco.

The McPherson Furnace & Supply Company of Portland, Oregon.

H. M. Sawrie of Montgomery, Alabama.

Walker Roofing Company of Atlanta, Georgia.

◆

## Mueller Eastern Facilities

L. J. Mueller Furnace Company, Milwaukee, announces the increase of their Eastern facilities. Branches are maintained in Baltimore, Philadelphia and Pittsburgh, with complete stocks.

C. L. Hewitt, Jr., Eastern sales manager, is in charge of the Baltimore office at Lafayette Ave. & Dickson street.

John G. Werner is in charge of the Philadelphia branch at Delaware Avenue and Tasker Street.

R. A. Warner directs the Pittsburgh branch at 20th & Wharton, South Side.

**Easy — Profitable to Sell WINTER AIR CONDITIONING with 400 Series Lau**

**BLO-ETTE**

The 1000 CFM Lau Package Unit Furnace Blower—only $42.50
(Other Sizes Available at Correspondingly Low Prices)

*Features of 401 Blo-Ette*

- Shipped assembled—goes through any door
- Large access door
- Circulates filtered air from basement for summer cooling
- Automatic cut-out on motor
- Two 16" x 25" filters
- Leak-proof filter frames
- Quiet operating
- Self-aligning—self-lubricating bearings
- Top Motor Mounting
- 1/6 H. P. Long Hour Motor

Blo-Ette is also sold less casing, filters, and motor

Blo-Ette opens a new field of blower sales for you in thousands of homes where unsatisfactory gravity furnaces are now installed. This centrifugal type blower increases heating plant efficiency up to 25%. Gently forced air eliminates drafty corners, cold floors, seeks out hard-to-heat rooms. Specially treated filters remove over 90% of dust, soot, lint, and dirt from air . . . a great protection to home-owner's nose and throat, to furniture, draperies, blankets, etc.

Shipped assembled, ready to install . . . low in cost!

*Mail coupon today for complete information and prices. Check items that interest you.*

**OTHER LAU PRODUCTS**

A Revolutionary, low-priced self-aligning PILLOW BLOCK . . . is absolutely self-aligning at all times, under all conditions. Also pulley wheels, blower housings, blower wheels, NITEAIR ATTIC FANS. Write for literature and prices.

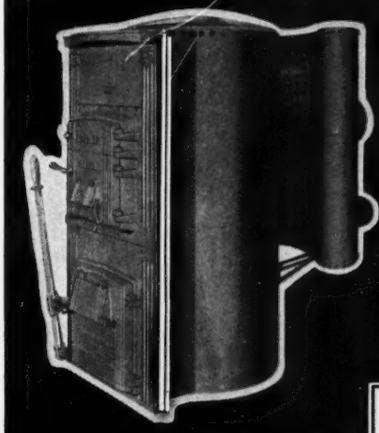
The Lau Blower Co.
934 E. Monument Ave., Dayton, Ohio

Gentlemen: Please send us FREE descriptive literature, data and prices on the following:

☐ 400 Series BLO-ETTE
☐ 700 Series BLOWERS
☐ Pillow Blocks
☐ Other .....

Name .....
Street .....
City .....State.....

## for Lasting Success . . Good Furnaces Plus an Effective Selling Program



S Series PREMIER Steel Furnace Leak-proof welded and riveted construction.

First of all . . . you MUST have good furnaces, in order to sell and satisfy intelligent buyers. PREMIER gives you those furnaces of real quality — more than 18 models and sizes of them...virtually hand made to assure lasting, efficient service.

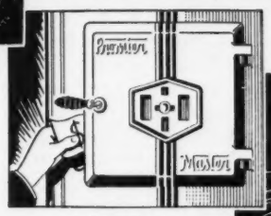
PREMIER winter air conditioners, package blowers, stokers, oil burners, cooling equipment — all show this same superb quality—**yet prices are in line with competitive goods.**

With this great line . . . with the amazing PREMIER 9-Point Dealer Program, you're set for sound success. And—your success is **protected** by the exclusive PREMIER franchise. WRITE TODAY for portfolio showing the line and explaining PREMIER cooperation.

**PREMIER FURNACE COMPANY . . . DOWAGIAC, MICH.**

# PREMIER
## FURNACES *and* AIR CONDITIONERS

Steel Furnaces riveted and welded. Permanently leak-proof.



Cast iron furnace sections assembled and fitted.

Doors fitted paper-tight.

G Series MASTER Cast Iron Furnace Streamlined body. Extra large one-piece radiator.

*Premier Helps You with 9-Point Dealer Program*

PREMIER cooperation aids you in building up sales, making better installations, and banking greater profits. Field engineers work right with you. Factory engineers plan jobs FREE. Free prospect follow-up service. Advertising and selling helps of many kinds. PREMIER-F.H.A. financing plans. Special pricing plans. And exclusive franchise!



# Largest GREENHOUSE in The World uses JOHNSON Oil BURNERS

● "For over two years we carefully watched and checked the operation of one Johnson 300-horsepower Rotary Burner under one of our boilers at our Plant B at Fort Washington, Pa.," writes George E. Lukens, of Florex Gardens.

● "Based on the results obtained at this Plant B, we decided to install five Johnson 300-horsepower Rotary Burners under five of our boilers at the main plant at North Wales. This larger installation has been in operation for over a year.

● "We are now burning fuel oil exclusively at both plants, and we do wish to tell you that we have been highly pleased with the satisfactory operation of these Johnson Burners. They have never given us any trouble, and aside from a few minor adjustments that were necessary after the installations were completed, we have never had a repair bill to speak of on any of them.

● "We bought Johnson burners because we believed them to be the best obtainable, and the satisfaction we have obtained in operating them seems to more than justify our decision."

*Since 1904*

the name of Johnson on an Oil Burner has been accepted as the seal of fine engineering, skilled craftsmanship and dependability. Johnson Burners on an architect's specifications insure satisfaction and comfort for the home owner. Johnson builds oil burners for every need of industry, commerce and home. Data sheets on each type of Johnson Improved Burners give complete information and specifications. Johnson engineers will be glad to assist in preparation of layouts and estimates.

MEMBER OBI OIL BURNER INSTITUTE

## S. T. JOHNSON COMPANY

940 Arlington, Oakland, California ● 401 North Broad St., Philadelphia, Pa.

## THERE'S A JOHNSON OIL BURNER FOR EVERY PURPOSE

Here's the ideal asbestos paper—the paper that has *everything!* It's RU-BER-OID—WATSON No. 43-A Asbestos Paper.

It has STRENGTH—obtained by special processing. It's made from 95% pure asbestos, and is flexible and of accurate caliper. More, its unusual wet strength simplifies paste application.

It has COLOR—the right color. It's blue white, and stays that color.

It has FINISH—on one side, a smooth and water-repellent finish; on the other, a rough-textured finish for better adhesion. Paint will cover the surface readily because there is so little absorption.

Use this outstanding No. 43-A Asbestos Paper for protecting air conditioning ducts, wood partitions, wrapping furnace pipes, lining stoves, ovens and gas ranges.

Mail the coupon for FREE 5-foot test sample. Compare! You, too, will say it has *everything.*

**RU-BER-OID R·W WATSON**
**ASBESTOS PAPERS**

The RUBEROID Co., *Insulation Department*
500 Fifth Avenue, New York City

Send us your free 5-foot test sample of No. 43-A Asbestos Paper. We understand this places us under no obligation. AA 8-39

*Name*.....

*Address*.....

*City*..... *State*.....

Since Ruberoid sells through wholesale trade only, please give jobber's name.

.....

**FREE** THIS CANISTER CONTAINING *5 foot Sample*


# With the Manufacturers . .

## Airtemp in Chicago

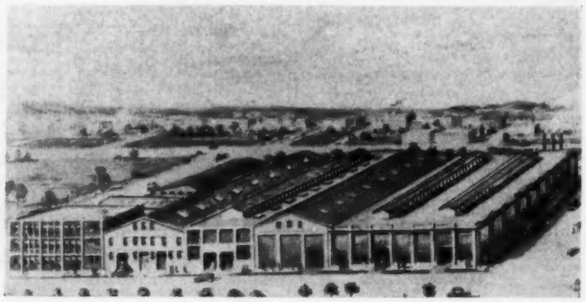
Airtemp Sales Corporation, a subsidiary of the Chrysler Corporation, has taken over the activities of the Airtemp Construction Corporation in the metropolitan Chicago area. Offices are now located at 508 Wrigley Building, Chicago.

Wallace F. Ardussi is Regional Manager.

◆

## Ryerson Boston Plant

Joseph T. Ryerson & Son, Inc., Chicago, is providing greatly increased steel service facilities for the Eastern area by the reconstruction of the plant at Third and Binney Streets, Cambridge. Ground area has been increased more



than 30 percent and storage facilities to a still greater extent through the use of multiple story building, special racks and platforms.

Ryerson operates a total of ten large plants in the principal industrial cities of the country.

◆

## Armco Promotes Wortley and Woods

The American Rolling Mill Co., Middletown, Ohio, announces the appointment of Foster E. Wortley as assistant manager of the mid-western sales area.

W. W. Sebald, vice president and assistant general manager of Armco, also announces the appointment of Henry L. Woods, Jr., as manager of the Cleveland district sales office to succeed Wortley.

◆

One of the new demonstrator truck units of the Anchor Stove & Range Company, bought for their regional factory salesmen. Two units, a residential Kolstoker and the new Anchor Stoker-fired cabinet heater, are bolted onto the truck floor. The truck is a bright red to match the red on the cabinet of the Kolstoker. Left to right are Ollie Williams, Regional sales representative, and Clifford M. Lewis, sales manager, at New Albany, Indiana.

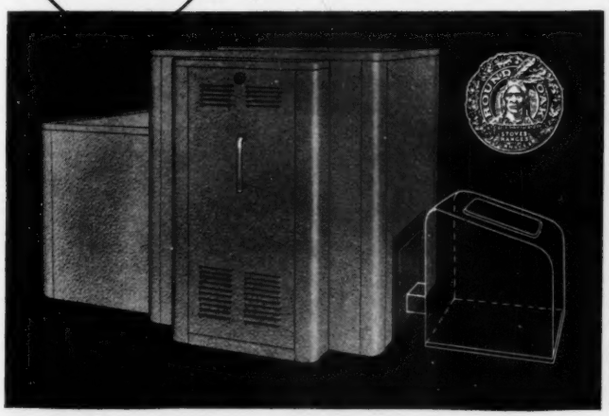
◆

## 25 Years with Hart & Cooley

Ralph W. Blanchard completed twenty-five years of continuous service with Hart & Cooley Manufacturing Company this spring. The event was celebrated at a dinner in his honor in Holland, Michigan, at which time his company presented him with a beautiful "Service" watch. Mr. Blanchard is a member of the National Warm Air Heating and Air Conditioning Association's board of directors and chairman of the membership committee.

# Another HEATING TRIUMPH

SK-600 SERIES • AIRKLENZER

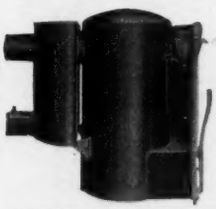


## This Means Money to Round Oak Dealers

EVERY DAY, warm air heating is pulling farther ahead in public preference. Every day, many Round Oak dealers are hitting new peaks in sales and profits. Leaders, such as the SK-600 Series Airklenzer (equipped with any standard stoker) open up new fields in any territory. And with the complete Round Oak line of coal-burning, oil-burning warm air furnaces and air conditioners, dealers are fully equipped to meet every heating requirement in homes of every size.

MOISTAIR BLENDED IRON

OTHER GREAT VALUES, such as the Moistair Blended Iron Furnace and Moistair Boiler Plate, offer the home owner coal heating economy that keeps him sold for life. Take advantage of everything Round Oak has to offer and you can really cash in on this steadily increasing preference for warm air heating.



MOISTAIR BOILER PLATE

**ROUND OAK COMPANY**
DOWAGIAC MICHIGAN

WRITE FOR LIBERAL FRANCHISE FACTS

# ROUND OUT with ROUND OAK

THE COMPLETE LINE OF WARM AIR EQUIPMENT

# Is Arc Welding Profitable?

## 3 TIMES YES! says *this* LINCOLN *user*

● Two years ago, the Burt Manufacturing Company, Akron, Ohio, purchased a Lincoln Welder and found that—

*Arc welding cuts sheet metal manufacturing costs.*

*Arc welding makes sheet metal products stronger, more rigid and better looking for improved business.*

Mr. C. A. Palmer, President, says, "The savings and improvements brought about by our first Lincoln Welder led us to use arc welding more extensively and to purchase 2 more Lincoln machines. This fact is evidence of how much we value this fabricating process and bespeaks our satisfaction with Lincoln service and equipment."

Highly successful applications of arc welding in this shop include stainless steel kettles, aluminum chutes (such as illustrated), aluminum molds for sponge rubber, brass and copper containers, and a wide variety of black iron and mild steel products.

You, too, can lower costs and improve your products with arc welding. Investigate the New Lincoln "*Shield-Arc* Junior." It is equipped with Self-Indicating "Job Selector" and Current Control, assuring the right TYPE of arc and the right AMPERAGE for highest speed and quality on every job. The price is surprisingly low.

For further details, consult the nearest Lincoln office or mail the coupon.

## THE LINCOLN ELECTRIC CO.

*Largest Manufacturers of Arc Welding Equipment in the World*

**MAIL THIS COUPON TODAY**

**THE LINCOLN ELECTRIC CO.**
**Dept. EE-625, Cleveland, Ohio.**

Send free Bul. 313 and payment details on the new Lincoln Sheet Metal Welder.

Name _____ Position _____

Company _____

Address _____

City _____ State _____

# New Literature . . . .

**For your convenience in obtaining copies of Literature, use the coupon on page 102.**

### 180—Tinners' Snips

The Clauss Shear Co., Fremont, Ohio, is distributing Catalog No. 56, pages 26 and 27 of which are devoted to tinners' snips—solid steel, drop forged and steel laid with inlaid blade.

◆

### 181—Sav-Haf Oil Burners

The Aldrich Company, Peoria, Illinois, is distributing a four-page folder illustrating and describing their "Sav-Haf" oil burner with specifications. There are four models —1 to 5, 3 to 7½, 6 to 18 and 12 to 36 gallons per hour.

◆

### 182—Zinc Dust Paints

The New Jersey Zinc Company, 160 Front Street, New York City, is distributing a 38-page booklet entitled "Improved Maintenance of Metal Surfaces with Zinc Dust Paints." Hiding power, spreading rates and rust inhibitive properties are mentioned.

◆

### 183—Taylor Roofing Ternes

Republic Steel Corporation, Republic Building, Cleveland, is distributing a four-page folder covering their 129 years of experience in building Taylor roofing ternes—Saxon, Avalon, Old Method, Taylor Extra Coated, Target and Arrow. Advantages, forms, sizes and gauges, and coating weights are given.

◆

### 184—Home Cooler Fans

The Emerson Electric Manufacturing Company, 1843 Washington Avenue, St. Louis, has just released a Home Cooler Fan catalog of 12 pages. New fans are featured. Illustrations of a number of installations show how the fans operate, how to regulate the cooling for greatest efficiency, and how these fans solve the problem of inexpensive cooling by reducing the night temperature 20 deg. Fans, plenum chambers, ceiling and outside shutters are illustrated and described.

◆

### 185—Furnace and Air Conditioning Folders

The Rybolt Heater Co., Ashland, Ohio, is distributing three new folders covering their Series 15, Series 157 with the Series 15 Rybolt cast iron heating element, and Series 600A7 with the new 600 series steel heating element. Specifications, capacities and dimensions are included.

◆

### 186—H & C Register Leaflets

Hart & Cooley Manufacturing Co., Holland, Michigan, is distributing two new envelope stuffers—one covering the No. 69 design register where economy is necessary, and the other the No. 86 design register with turning blade valve and adjustable to any of 18 different air flows. List prices are included.

◆

### 187—Self-Contained Air Conditioners

The Trane Company, LaCrosse, Wisconsin, is distributing a Bulletin S398 covering Trane air conditioners for summer comfort, or with the addition of a Trane heating coil, a year 'round conditioner. Two models are shown—one of 3 and 5 h. p., and the other a 7½ and 10 h. p. model for application with duct work.

◆

### 188—Condensing Units

Universal Cooler Corporation, 7214 Melville St., Detroit, is distributing an 8-page folder covering their condensing units for air conditioning, low temperature and commercial refrigeration. The line consists of over a hundred different condensing units in a variety of capacities and sizes, ranging from 1/6 to 15 h. p.


# The GALE "Seal-Tite" REGISTER

**ABSOLUTELY AND PERMANENTLY STREAK-PROOF!**

## A High Quality Register at a Surprisingly Low Price

The Gale "Seal-Tite" has everything you expect in a register—and in addition, completely solves the problem of wall-streaking. Handsome in appearance. Directs air flow scientifically for greatest comfort without drafts. An outstanding value—you'll be surprised at our reasonable prices and attractive discounts.

ASK YOUR JOBBER

or write us direct for catalog showing baseboard and sidewall types. Sizes: 4"—5"—6"—8"—10" heights. 8"—10"—12"—14"—24"—30" widths. Other sizes made up special.

**We also make GALE—**
**"Pre-Fabricated" Ducts & Fittings**

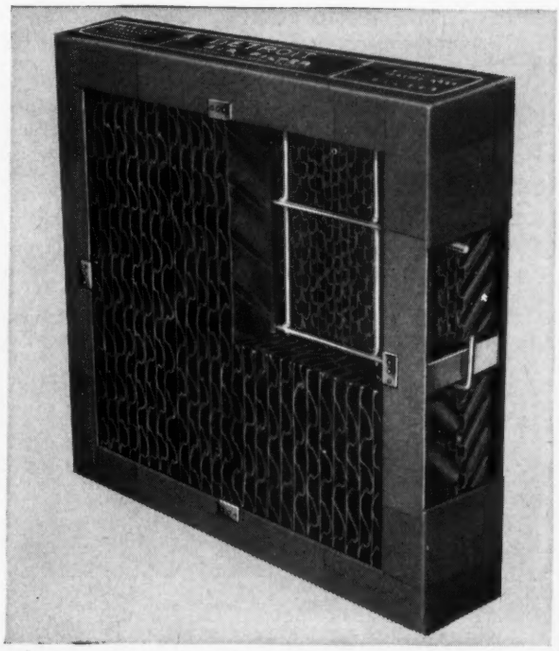
*"Seal-Tite"*
ONE-PIECE CONSTRUCTION
ELIMINATES WALL-STREAKING

No more complaints from customers about unsightly soot streaks—if you use the GALE "Seal-Tite" Register. We have solved this problem with an exclusive flexible packing which is an integral part of the back frame. No need to mount sealing frames when roughing-in. The Gale is a complete unit—simplifies your job—satisfies your customers.

**CHAR-GALE MFG. CO.**
3125 Hiawatha Avenue
Minneapolis Minnesota

# DETROIT AIR FILTERS

## Formerly The Arco Air Filter



### ADVANTAGES

**1.** High cleaning efficiency (90% dust removal).

**2.** Retains initial efficiency longer than other filters.

**3.** Filter may be used in any position. Will not warp or sag.

**4.** High dust capacity—longer service life.

**5.** Low air resistance—no spot clogging.

**6.** Odorless—remains tacky at 10°—will not drip at 180°.

**7.** Rigid construction—does not pull apart when removing for replacement.

**8.** No particles of adhesive or filter material can be carried in the air stream.

**9.** Air stream leaving the filter may be directed by the filter itself.

**10.** Serves as an effective sound deadener.

**11.** Economical—long service life—costs less than many filters, not any more than other replacement filters.

***Write for descriptive bulletin***

**DETROIT LUBRICATOR COMPANY**

*General Offices:* DETROIT, MICHIGAN

Canadian Representatives—RAILWAY AND ENGINEERING SPECIALTIES LIMITED
Montreal • Toronto • Winnipeg

---

# INSTALL CERAMICS THIS EASY WAY!

● Skuttle's newly improved cadmium-plated steel collar (now standard equipment on all D S Skuttle Humidifiers) makes it easier for you to place a ceramic unit in the humidifier pan after the humidifier has already been installed. This type collar is certainly an improvement over the old-fashioned type because its adjustable feature eliminates entirely the expense of wasting time in cutting into the plenum chamber or bonnet of the furnace and then patching the hole after the ceramics are inserted. Let us send you further information on this time-saving improvement.

WRITE TODAY FOR **Skuttle** INFORMATION

J. L. SKUTTLE COMPANY — AUTOMATIC HUMIDIFIERS — 999 FRANKLIN ST., DETROIT, MICH.

# New Literature . . . .

**For your convenience in obtaining copies of new Literature, use the coupon on page 102.**

### 189—Folders and Brakes

Niagara Machine & Tool Works, 637 Northland Avenue, Buffalo, is distributing Bulletin No. 74-A, covering Niagara manually and power operated folders and brakes.

### 190—Gas, Oil and Stoker-fired Stokol Heat

Schwitzer-Cummins Company, Indianapolis, Indiana, is distributing three 4-page folders with advance specifications of Stokol-Heat—gas, oil and stoker fired.

### 191—Barclay 1939 Fall Catalog

Robert Barclay, Inc., 122 North Peoria St., Chicago, is distributing Catalog No. 109 for fall, 1939. There are 63 pages of accessories for oil burners, stokers and forced air heating.

### 192—Monel, Nickel, Inconel

The International Nickel Company, Inc., 67 Wall Street, New York City, is distributing a 6-page folder containing basic information on mechanical, corrosion-resistant and other properties of rolled nickel, Monel, and other high nickel alloys.

### 193—Electro-Matic Air Filter

American Air Filter Company, Inc., First and Central Avenue, Louisville, Kentucky, is distributing a new Bulletin No. 250 covering the recently announced Electro-Matic air filter, to be installed by a sheet metal contractor and operated by the average maintenance man.

Electrical precipitation is combined with automatic air filtration to obtain a higher efficiency in dust removal and operating advantages. Diagrams and cut-away sections show how electrical precipitation and automatic air filtration have been combined in a compact self-contained unit.

### 194—Summer Health All Year 'Round

Cleveland Steel Products Corporation, Toridheet Division, Madison at W. 74th Street, Cleveland, is distributing a 4-page folder entitled "Sumer Health All Year 'Round" with the Toridheet air conditioning furnace—Series OMA oil-fired.

### 195—Trane Reciprocating Compressors

The Trane Company, LaCrosse, Wisconsin, is distributing Bulletin S341 covering Trane Reciprocating Compressor Design with specifications. There are 10 sizes with capacities of 3, 5, 7½, 10, 15, 20, 25, 30, 40 and 50 tons; all in two models. One model is designed for use where condenser water is available at low cost and the other where condensing water costs are high.

### 196—Friction Chart and Equivalent Duct Tables

Utica Radiator Corporation, 2201 Dwyer Ave., Utica, N. Y., is distributing a revised air duct friction chart and table for converting from round to rectangular sizes—data from the ASH&VE research paper "Frictional Resistance to the Flow of Air in Straight Ducts," by F. C. Houghton, J. B. Schmieler, J. A. Zalovich and N. Ivanovic. The chart and tables are printed on rag bristol, for hanging on the wall. Utica Radiator products are described.

### 197—Ventilators and Skylights

Milcor Steel Company, Milwaukee, Wisconsin, has just published Milcor Ventilator and Skylight Book No. 42, with illustrations and data of the Milcor line. Dimensions for each ventilator are listed showing flue size, the extreme height and width, accurate exhaust displacements and crated shipping weights.

In the skylight section, full-size, cross section details of each of the different types of Milcor skylights are given.

NEW MODERN DESIGN

**Easy Foot Operation with Niagara Gap Shears**

It is smart buying to choose a gap shear. 18 inch gap lets you cut sheets longer than cutting length of shear! New modern design provides easy foot operation and convenient handling of sheets. Rigid housings maintain alignment of working parts and accuracy of knife travel. Self-locking eccentrics make it possible to let go of the holddown while stepping on the treadle.

Complete with gages and genuine Niagara alloy steel knives.

Send coupon for Bulletin 80-B

NIAGARA MACHINE & TOOL WORKS
637-97 Northland Ave., Buffalo, N. Y.
Please send copy of Bulletin 80-B.
Name .....
Concern .....
Street .....City.....
A.A.-839

NIAGARA

# *Now* . . . A Complete G-A TEMPERATURE CONTROL PACKAGE UNIT

**ESPECIALLY PRICED for the 8 out of 10** hand-fired heating plants not now equipped with temperature controls.

*G-A Temperature Control System No. 118 complete with all accessories, including G-A single thermostat and G-A control motor. For 110 volt 60 cycle A.C. (other voltages and frequencies available).*

Think of it—of the 6 million hand-fired heating plants nearly 5 million are still WITHOUT temperature controls of any kind! Cash in on this wide-open market! Sell them the compact, low-cost G-A Package Unit. Has all the proved sensitivity and dependability of famous Gleason-Avery thermostatic controls. It is engineered to give trouble-free performance—that has been proved under all operating conditions.

It is priced to give you a greater profit margin—yet priced within the reach of every home. Selling features that spell greater salability and better opportunity for profit for the dealer. Right now is the time to cultivate this tremendous market—for greater sales and higher profits.

**G-A Single Relay Control #107**

The ideal set for the thermostatic control of fans, blowers, circulating pumps and all other 110 volt loads. Each package contains G-A single thermostat, transformer-relay and accessories. For 110 volt, 60 cycle, A.C., only.

WRITE TODAY for full details and new catalog of the complete G-A line—including control motors, limit switches, relays, time switches, stoker controls, etc.—and we will be glad to send you the name of your nearest jobber.

**DISTRICT REPRESENTATIVES**

The H. M. Flemming Co., Inc.
30 Church Street
New York City

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Mr. Floyd T. Whitney
5736—12th Street
Detroit, Michigan

Smith & Dale
457 Stuart Street
Boston, Massachusetts

•

Mr. Fred W. Forward
520 West Boulevard
Elkhart, Indiana

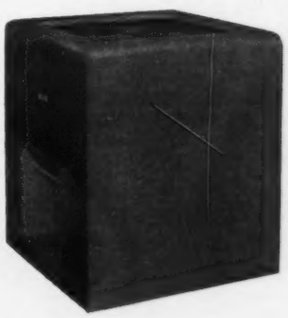
## GLEASON-AVERY, INC.

**25 Clark Street** **Auburn, New York**

# See the BIG BROADCAST FOR 1939-1940

**LARGER MARGINS FOR YOU**

**GREATER VALUES FOR CONSUMER**

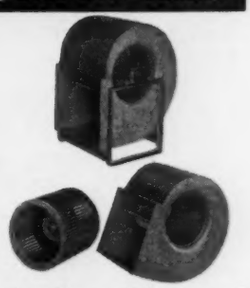


## USAIRCO BLOWER-FILTER PACKAGE UNIT

**EVERY VALUE FEATURE PLUS USAIRCO ENGINEERING**

**USAIRCO UNITS ARE COMPLETE** with Blower, Drive, Motor, Filters and Furnace-stat. Simply Engineered, Strong, Durable Construction, Quiet, Dependable, Economical Operation. Pleasing Design, Attractive Finish. Every Part Highest Quality. Completely Guaranteed. Write for Detailed Specifications of the year's biggest values.

**Get USAIRCO's Price Schedule, Discounts, Detailed Descriptions of Big 1939-1940 Values**



## USAIRCO BLOWER ASSEMBLIES SCROLL HOUSING WHEELS

USAIRCO offers a wide selection of Double Inlet Blower Assemblies with or without Drive and Motor, also Blower Wheels and Scroll Housings. A big line of outstanding values. Larger margins for you. Greater Value for your trade.

**INFORMATION CARD**

**United States Air Conditioning Corp.** AA-839
**Northwestern Terminal**
**Minneapolis, Minnesota**

If you have a bigger value at a better price, we want all the details. Send us complete information.

☐ Blower-Filter Package Units ☐ Furnace-Blower Assemblies
☐ Wheels and Scroll Housings

Name_____

Address_____

Town_____ State_____

# New Literature . . . .

**For your convenience in obtaining copies of new literature, use the coupon on this page.**

## 198—Registers and Grilles

Standard Stamping & Perforating Co., 3131 West 49th Place, Chicago, is distributing their new 1939 catalog with information concerning perforated metal, registers and grilles.

◆

## 199—Power Squaring Shears

Niagara Machine & Tool Works, 637 Northland Avenue, Buffalo, is distributing a new Bulletin No. 71-G, illustrating and describing Niagara Series 100, 10 and 500 power squaring shears, with capacities up to 14 gage.

◆

## 200—Air Conditioning and Its Developments

The University of Illinois Engineering Experiment Station, Urbana, has a limited supply of free copies of a book, a reprint of 11 semi-technical papers presented at the second University of Illinois Conference on Air Conditioning. The discussions cover year-around air conditioning, which involves winter heating as well as summer cooling. Subjects and authors are:

Equipment for all year air conditioning—Prof. W. H. Severns and Prof. P. E. Mohn.
Characteristics of duct systems and fans—S. H. Downs.
Introduction and diffusion of conditioned air in rooms—Prof. D. W. Nelson.
Regulation of air temperature and humidity—C. L. Ringquist.
Refrigeration problems in comfort air conditioning—R. E. Gould.
Building insulation, types and applications—Prof. Seichi Konzo.
Condensation problems in modern buildings—L. V. Teesdale.
Air Conditoning water supply and disposal—W. D. Gerber.
Conservation of water by using cooling towers and evaporative condensers—S. I. Rottmayer.
Heat interchanges between the human body and surrounding atmosphere—Dr. Charles Sheard.

## 201—Ryerson Stock List

Joseph T. Ryerson & Son, Inc., 16th & Rockwell Sts., Chicago, is distributing a new Stock List and Steel Data Book, including a detailed listing of the new products and sizes recently added. Weights, length, cutting data and other pertinent information is given. Tab index dividers, eye-conditioned paper, and mechanical binding.

◆

## 202—Monovent Continuous Ridge Ventilator

The Burt Manufacturing Company, Akron, Ohio, announces changes and improvements in their Monovent Continuous Ridge Ventilator.

Improvements include several types of damper operators, both manual and motor operated. Detailed methods of mounting and flashing the ventilator are shown.

**FOR YOUR CONVENIENCE**

American Artisan, 6 N. Michigan Ave.,
Chicago, Ill.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "New Products" and "New Literature." (Circle numbers in which you are interested):

| | | | | | | |
|---|---|---|---|---|---|---|
| 130 | 131 | 132 | 133 | 134 | 135 | 136 |
| 137 | 138 | 139 | 140 | 141 | 142 | 143 |
| 144 | 145 | 146 | 147 | 148 | 149 | 150 |
| 151 | 152 | 153 | 154 | 155 | 156 | |
| 180 | 181 | 182 | 183 | 184 | 185 | 186 |
| 187 | 188 | 189 | 190 | 191 | 192 | 193 |
| 194 | 195 | 196 | 197 | 198 | 199 | 200 |
| 201 | 202 | | | | | |

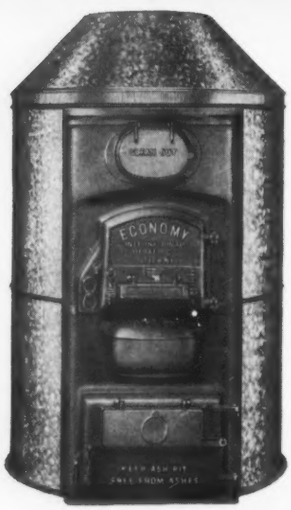
Name ..... Title.....

Company .....

Address .....

Are you Manufacturer——Jobber——Dealer——


# *new*, LARGE 30" FURNACE!




**International Heater is now offering, in addition to their regular full line of Economy Blue Front and Carton Furnaces, a new extra large 30" furnace. This rounds out the International line to take care of every warm air heating condition.**

**TEN YEAR MAINTENANCE AGREEMENT**

**All International Furnaces can be covered by our Ten Year Maintenance Agreement which operates like an insurance policy and takes care of replacement labor and materials over a period of ten years. It is the only maintenance agreement that fully protects jobber, heating contractor, and owner alike. It is the most powerful selling help ever offered the heating trade and home owners are demanding International products covered by this protection.**

**COVERS EVEN GRATE BARS**

**The Ten Year Maintenance Agreement covers all cast parts which may need replacing within ten years—even grate bars—plus a labor allowance. Only International dealers can offer this complete protection and International dealers are getting the business. Send for complete information to Dept. A-4—today.**

INTERNATIONAL HEATER COMPANY
UTICA, N.Y., U.S.A.

Western Office and Warehouse, 1933 Wentworth Avenue, Chicago, Ill. • New England Office and Warehouse, 110 Chestnut St., Nashua, N.H.
*Stocks carried in Principal Cities throughout the U. S.*

## TO INSTALLERS OF GAS APPLIANCES

**DON'T READ THIS AD**

if you are satisfied that the GAS VENTS and FLUES you are installing are giving 100% satisfaction because if you are you must be using

# METALBESTOS

"THE PERFECT GAS VENT & FLUE PIPE"

and are therefore familiar with its merits.

If you are not, you owe it to yourselves and your customers to get acquainted with METALBESTOS. True, it costs a few cents per foot more than some pipes, but don't let that scare you. These other pipes are not made SOLELY for venting gas appliances as is METALBESTOS and in no way compare with it from standpoints of EFFICIENCY, SAFETY, DURABILITY and LOW COST INSTALLED.

Actual installation figures prove that METALBESTOS can be installed two to three times more quickly than other pipes. SO WHY WORRY ABOUT A FEW CENTS PER FOOT?

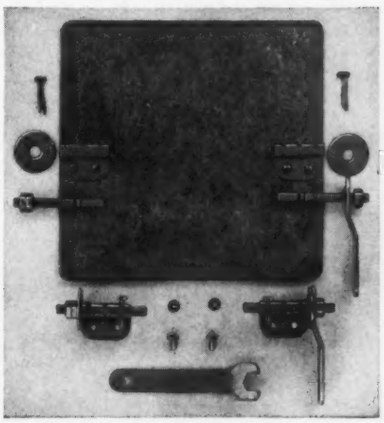
Once installed METALBESTOS ends your venting problems. No going back to the job to provide drains for condensate and no trouble with combustion due to improper draft.

WRITE FOR INFORMATION TODAY TO

**WILLIAMS-WALLACE COMPANY**

**160 Hooper St.** **San Francisco, Cal.**

# K-B DAMPER CONTROL



## Extra Special Prices

*TO INTRODUCE THE NEW*

**K-B DAMPER CONTROL**

TO THE TRADE

The following prices are F.O.B. Cincinnati, Ohio, and are made for strictly C.O.D. or CASH with order. All prices subject to Federal or State tax and to change without notice.

| | | |
|---|---|---|
| No. 100 | Standard | $0.15 per set |
| No. 100½ | For ½" insulating | .20 per set |
| No. 101 | For 1" insulating | .23 per set |
| No. 101½ | For 1½" insulating | .26 per set |
| No. 102 | For 2" furring | .28 per set |
| No. 103 | For 3" furring | .28 per set |
| No. 105 | For 5" furring | .35 per set |
| No. 107 | For 7" furring | .40 per set |

Longer than No. 107 add 4c per inch.
Rods ¼". All parts cadmium plated.

**G. L. KERENTOFF**

2803 Jefferson Ave., Cincinnati, Ohio

# THE LOCKFORMER LINE

For modern shop operation,

Saves labor—Increases profit!

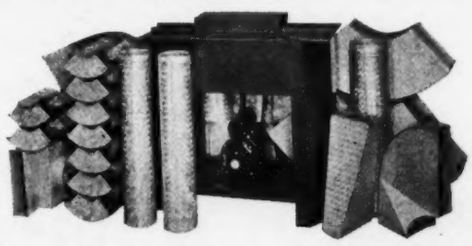
| | |
|---|---|
| *LOCKFORMER 22 (22-28 Ga.) | $270.00 |
| *LOCKFORMER 18 (18-26 Ga.) | $485.00 |
| POWER FLANGER | $135.00 |
| EASY EDGER (less Stand) | $33.50 |

*with built in Pittsburgh Rolls only.
Auxiliary rolls for many additional operations at slight added cost.

LOCKFORMER equipment is NOW available on our EASY TIME-PAYMENT PLAN everywhere—as low as $20.00 per month. For particulars, sample locks, terms—etc. see your supply dealer or write us. DEALERS: Write for our profitable, liberal selling plan!

**THE LOCKFORMER COMPANY**

**4632 West Flournoy St.** **Chicago, Ill.**



*(Prices F.O.B. Chicago, subject to change without notice.)*

# DON'T

**make a move until you get G-E's BIG NEWS!**

•

**All about *new lines . . . new low prices . . . new profits!***

•

**This coupon may mean real money to you . . . *fill it out and mail today!***

**General Electric Company,** Div. 190-153, **Bloomfield, New Jersey**

Send me the *G-E news.*

Name_____

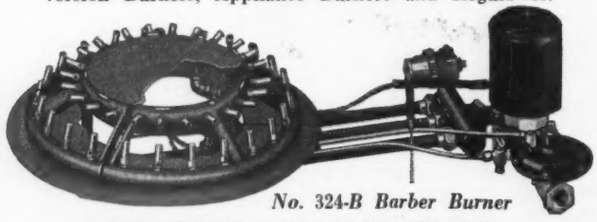
Street_____

City_____ State_____

# BARBER Gas Conversion BURNERS

Generate maximum *resultful* heat with minimum fuel cost ● Combustion efficiency of patented Barber Jets obtainable in no other burner ● If you want satisfactory sales and freedom from servicing—you want BARBER BURNERS!

Listed in A. G. A. Directory of Approved Appliances. A wide range of sizes for both round and oblong furnaces and boilers, all properly adjustable to grate dimensions. Write for catalog and price list on Conversion Burners, Appliance Burners and Regulators.



*No. 324-B Barber Burner*

**THE BARBER GAS BURNER CO.**

3704 Superior Ave. Cleveland, Ohio

**BARBER *Automatic* JET GAS BURNERS**

for Furnaces, Boilers, and Appliances



# STAR BRAND

**FOR EASIER, BETTER RIVETING**

Star Brand Rivets mean faster, smoother going on any riveting job —and assure best results.

Precision manufacture and rigid inspection insure accurate sizes and uniform quality.

Rivets are an important trifle. Use the best—Star Brand—the standard of quality for 76 years.

If your jobber or dealer can't supply you—write direct.

COPPER BRAZIERS AND TINNERS' RIVETS
ROUND, FLAT AND COUNTERSUNK HEADS
★ ALSO SPECIALS FROM
BRASS, BRONZE, NICKEL-SILVER
EVERDUR, MONEL, NICKEL
AND OTHER NON-FERROUS METALS

OTHER PRODUCTS
SCREW MACHINE PRODUCTS
STOVE BOLTS - MACHINE SCREWS
MACHINE SCREW NUTS
Special headed & threaded parts made from wire and rod

**BLAKE & JOHNSON CO. Est. 1849**

WATERVILLE · CONNECTICUT


## Structural Betterments Reduce Cooling Load

(*Continued from page 62*)

introduced into the house but also on the temperature and relative humidity of the outdoor air. In this connection, it may be noted that when the moisture content of the outdoor air is high, as was the case in 1935,* the numerical value of item 7 may be much greater than that listed in Table 4. Restricting the amount of air required for ventilation tends to accentuate any odors, and further reduction in the number of air changes may not be advisable in the average residence. The values listed as items 8, 9, and 10 are usually insignificant in the case of residence installations, although they may be of considerable importance in commercial or industrial installations.

An analysis of the components of the calculated cooling load therefore indicates that the size of the cooling unit required and the cost of operation of the unit may be materially reduced by substantial improvements in the construction of the house. The use of awnings on all windows exposed to the sun, of double glass in windows, and of effective insulation both in the sidewalls and in second story ceilings or attic floors should be encouraged if summer cooling of residences is to become a practical matter.

*The load due to ventilation at 2:00 p. m. on August 2, 1935, was 8715 B.t.u. per hr.

◆

# News Items . . . . . .

### Air Conditioning in Canada

The Air Conditioning Industries branch of the Board of Trade of the City of Toronto, Ontario, Canada, has completed its first year of operations as an association of those engaged in the Air Conditioning Industries.

A summary of Retiring Chairman E. C. Williams' report of the accomplishments of the association includes a definition of Air Conditioning; consideration of the place of correspondence trade schools in the industry; a discussion of the effect of air conditioning installations on water and sewerage facilities; a discussion of trade practices; the study of the National Building Code in the process of preparation; a consideration of a Code of Minimum Requirements for Comfort Air Conditioning; a consideration of the proposed new City of Ottawa fire code insofar as air conditioning equipment is concerned; installation of hot air heating systems; regulations in connection with the installation of heating equipment in Toronto; a file of codes already adopted in certain cities; the undertaking by the Bureau of Statistics to gather data concerning the air conditioning industries; a desire to co-operate with the Canadian Refrigeration and Air Conditioning Association in all matters pertaining to air conditioning cooperation with the Oil Heating Branch of the Board; consideration of an insignia for use by members in their advertising; and membership in the association.

F. D. Tolchard, General Manager.

◆

### L. G. Johnson Sole Proprietor

Laurence G. Johnson, president and general manager of the Automotive Sales and Air Conditioning Heating Co., 205 N. Mitchell St., Cadillac, Michigan, is now sole proprietor and owner of the company—G. W. Johanson, formerly secretary-treasurer, having sold his interest.

# PERFORATED METALS

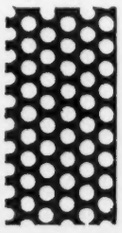
Every Sheet Metal Worker needs perforated metal in one form or another.

For processing food products and to withstand certain chemicals, perforated Stainless Steel and Monel Metal are much used.

Factory Safety Guards—For this service perforated metal has no equal.

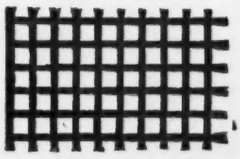
For Grilles, Radiator Enclosures, Air Conditioning Cabinets, we have many beautiful designs.

Write today for information and prices.



You'll like H&K prompt, satisfying work and pleasing prices.

Perforators of metals since 1883. Send us your specifications.



The Harrington & King PERFORATING CO.

5649 Fillmore St., Chicago, Ill. New York Office, 114 Liberty St.

## "HAVE CLARAGE MAKE THEM"

Every year we ship to furnace manufacturers and to builders of unit air conditioners thousands upon thousands of Clarage Blower Wheels and Assemblies. These smaller units were designed with the same skill characteristic of the larger Clarage equipment — just as carefully constructed — just as carefully tested. And we have sizes to meet ALL REQUIREMENTS — with slow speed operation insuring SILENT PERFORMANCE. May we have your next inquiry?

SPECIFY CLARAGE for COMPLETE AIR CONDITIONING • VENTILATION • HEATING • COOLING • MECHANICAL DRAFT • FANS & BLOWERS FOR INDUSTRIAL NEEDS

CLARAGE FAN COMPANY • Kalamazoo, Mich.
SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES



# WHITNEY LEVER PUNCHES

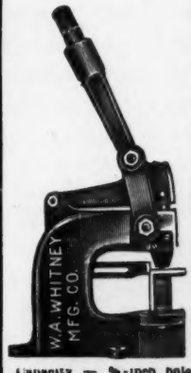
**No. 4B PUNCH**

Length—8½ inches. Capacity ¼-inch through 16 gauge. Deep Throat—2 inches. Weight—3 pounds. Punches and Dies—⅛" to ⅜" by 64ths.

**No. 6 PUNCH**

Length—26½ inches. Capacity — ¼-inch hole through ⅜-inch iron; especially adapted for button punching or templet work. Punches and dies ⅛" to ⅜" by 32nds.

**No. 91 PUNCH**

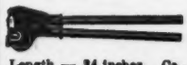



Capacity — ⅝-inch hole through ¼-inch, 1-inch hole through ⅜-inch and 2-inch hole through ⅛-inch iron. Depth throat 5 inches. Weight—82 lbs.

*We have tools for every purpose needed by Sheet Metal Contractors.*

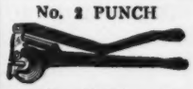
*Ask your Jobber*

**No. 1 PUNCH**



Length — 34 inches. Capacity — ⅛-inch hole through ⅛-inch iron. Punches and dies in sizes from ⅛ to ⅜ by 64ths.

**No. 2 PUNCH**



Length — 23 inches. Capacity — ⅜-inch hole through ¼-inch iron. Punches and dies in sizes ⅜-inch to ½-inch by 64ths.

**CHANNEL IRON PUNCH**

Companion to No. 2 Punch. Every part of the two Punches Interchangeable, including punches and dies. Capacity—¼-inch hole through ¼-inch iron.

W.A. WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.



# NEW, LOW PRICE

BREUER'S Ball Bearing

## TORNADO

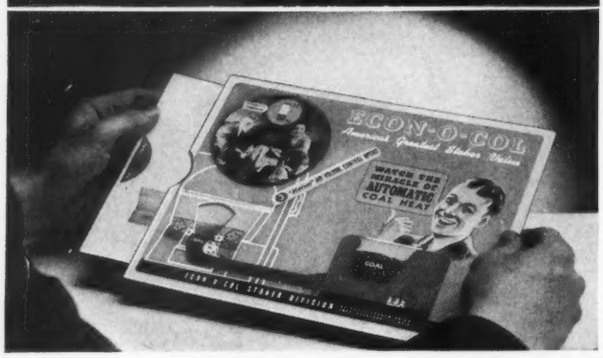
FURNACE & BOILER VACUUM CLEANER

Now you can buy a TORNADO for no more than you would pay for a cheaply constructed, converted household cleaner. A real quality machine, this sensationally low priced model 64-A combines those features which have made TORNADO cleaners the leaders for years,—ample cleaning power, big sturdy G. E. motor mounted on Norma ball bearings, portability and a complete set of attachments really designed for furnace and boiler cleaning. Built to last for years and help you make a real profit on furnace cleaning.

*Here is the Tornado you have been waiting for. Write for full specifications and FREE TRIAL OFFER.*

BREUER ELECTRIC MFG. CO.
5082 N. Ravenswood Ave. Chicago, Illinois

SEE AMAZING NEW DEMONSTRATING
"Quickie"




● It's new! It's practical! It's ingenious! Econ-O-Col's new "Demonstrating Quickie" can be taken right into the home to quickly, colorfully, concisely tell WHAT a stoker is, HOW it operates and WHY it solves winter heating problems. Yet, it is just one of many potent merchandising helps developed for the stoker which dealers are PROUD to sell! Write or wire today—let our representative show you this sensational "Quickie" and the other money-making features of the 1939-40 Econ-O-Col franchise.

ECONOCOL Automatic COAL BURNER

ECON-O-COL

*The "Stronghearted" Stoker*

MANUFACTURED BY COTTA TRANSMISSION CORPORATION, ROCKFORD, ILLINOIS

WHERE

are the real dealer profits in the heating business

?

*You'll find out*—if you get G-E's BIG NEWS!

All about *new lines . . . new low prices . . . new profits!* Wait for it!

•

*Fill in and mail coupon right away!* It may mean a brand new profit-making future for you!

General Electric Company, Div. 190-453, Bloomfield, New Jersey

Send me the *G-E news.*

Name_____

Street_____

City_____ State_____

# Konzo, Cooling With Water

(*Continued from page 60*)

Research Residence when no cooling was used at all have varied from 50 per cent to 85 per cent, with an average value of about 70 per cent. In drier sections of the country undoubtedly lower humidity conditions exist even when no artificial cooling is used. Furthermore, during the operation of the cooling plant on some of the more humid days, the moisture condensed from the circulating air has amounted to as much as 1 gallon to 1½ gallons per hr. It is evident that the moisture load, relative humidity, and mean coil temperatures are an important aspect of comfort cooling.

### Cost of Operation

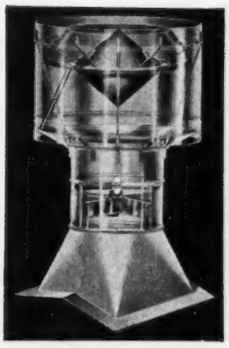
A direct comparison of the seasonal costs of operation for the plant using ice, the plant using mechanical refrigeration, and the plant using water at temperatures of 58 deg. F., 52 deg. F., and 46 deg. F. is not possible owing to the fact that each plant was operated under two different conditions for part of the season, and that the number of degree-hours above 85 deg. F. was different for all seasons. However, it is possible to calculate the seasonal costs for any given season. In the results shown in Engineering Experiment Station Bulletin 290 the season of 1934 was selected as the common season for which the operating costs were to be calculated.

"From this study it was determined that if the plant using ice had been operated during the season of 1934 with supplementary use of cooling with outdoor air at night and with the Residence equipped with awnings, the total cost would have been $191.00. Under the same conditions, the seasonal cost for operating the plant using mechanical refrigeration has been estimated as $60.37. The costs of cooling with water were estimated under similar operating conditions, except that during the standby period between 7:00 A. M. and the time that the cooling plant was started the fan was recirculating the air in the house. With the slight additional cost accounted for by the electrical input required to recirculate the air during this period, as shown in Column 6, Table 1, the total seasonal costs for water at temperatures of 58 deg. F., 52 deg. F., and 46 deg. F. were estimated as $61.36, $55.15, and $46.84 respectively. These cost estimates, based on a common season having 2,658 degree-hours, show that the operating costs of a plant using water are not unreasonable with the rates for water and electricity prevailing in Urbana, Illinois.

### Advantages and Disadvantages

"In considering the possible application of cold water as a medium for cooling structures similar to the Research Residence some attention should be given to both the advantages and the disadvantages of the method. These may be itemized as follows:

# BURT Ventilators Give You the Edge on Competition



Whatever the job, public or private, whatever the specification requirement, you can meet it best with the broad and complete Burt line of roof ventilators. Burt makes a size and a type for every purpose, of any kind or gauge of material required. Remember, Burt Engineers are glad to help you land the job by assisting with plans and estimates.

*Write for catalogs.*

**The BURT MFG. Co.**
301 Main St., Akron, Ohio

BENDING BRAKES **WHITNEY-JENSEN** METAL TOOLS

**ANGLE IRON TOOLS**
**No. 455 COMBINATION**

● Shear, Notcher, and Bender, all in one unit on a sturdy welded stand. Capacity, 2" x 2" x ¼" angle iron. A handy unit for all-around work.

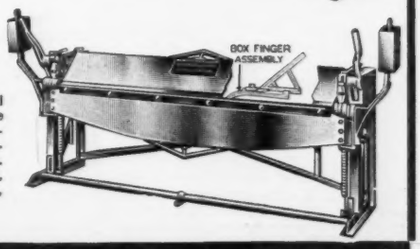
**OVER 80 USEFUL ITEMS**
Send for Whitney-Jensen Catalog No. 12 showing over 80 useful sheet-metal and metal-working punches, shears, brakes, hand tools, etc.

**COMBINATION BENDING BRAKES**
**20 GA.**

● Portable light-weight Brakes in bench and floor models, plain or combination type. Easily carried to the job. Ideal for duct installation work, capacity 20 ga., 49 in. size.

**12 - 14 - 16 GA.**

● Roller bearings speed up work 40% and are 20% easier on operator. Greatest improvement in 40 years. Combination type, 12, 14, or 16 ga. capacity, 4-5-6-8-10 ft. sizes.




WHITNEY METAL TOOL CO. • 91 Forbes Street, Rockford, Illinois

# PREMIER FURNACE CLEANERS
## —*For a Real Clean-up!*

You're all set to "clean-up" right when you buy Premier! Weighing less than 50 pounds, they are one-man cleaners and have been the furnace man's favorite for years. Premier Cleaners are ideal for upstairs use and may be used independently from the container for suction and blowing use in cleaning air ducts, registers, grilles, radiators and air conditioning equipment.

**New Improved Models—Completely Equipped**

⅝ Horsepower **$69.50**

1 Horsepower **$89.50**

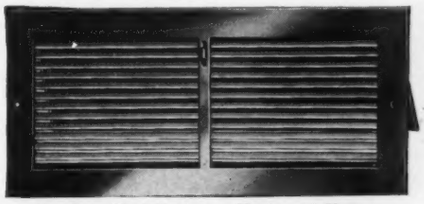
ELECTRIC VACUUM CLEANER CO., INC.
1734 Ivanhoe Road • Cleveland, Ohio

NEW!

# REGISTER FACES by ROCK ISLAND

The New Rock Island Air-Vane Registers are of bar type fabricated construction —Attractive Appearance—Rigid Construction—Vertical or Horizontal Vanes—Simple, secure adjustment. New Catalogue gives full particulars, prices, etc. Write for a copy.

*No. 802—Wall Register—Vertical Vanes*



*No. 822—Wall Register—Horizontal Vanes*

*Send TODAY for Free Catalog*

**Rock Island Register Company**
Rock Island Illinois

**You'll get more firepot jobs with FIRELINE**

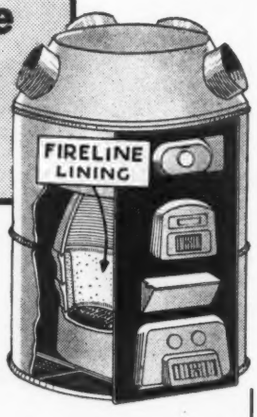



Figure it anyway you will, you'll make more money if you push Fireline. Lots of people will pay to repair their burned out firepots with Fireline who just won't spend the money for new castings. Fireline saves homeowners about half, still you make approximately the same profit on the job—only you make it faster.

Fireline, the new plastic fire brick material, is installed completely around the inside firepot wall approximately 1 inch thick (right through the furnace door if necessary.) It sets into a 1-piece refractory lining. Makes cracked or even badly broken firepots gas-tight. It raises combustion temperatures, increases heating capacity, burns up smoke, soot and furnace gas, and pays for itself in a few months in fuel savings alone.

Repair cracked and broken firepots — gives heat the same day.

Protects new castings.

Also, replaces broken fire brick in steel furnaces. Ideal for setting stokers and oil burners.

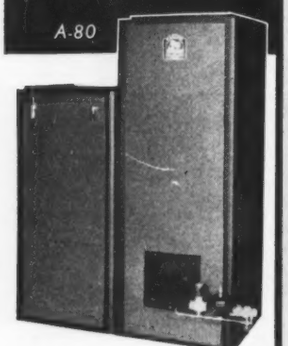
Now advertised to 1,833,648 householders in Better Homes and Gardens. Better order a supply today.

**FIRELINE STOVE & FURNACE LINING CO.**
**1866 H KINGSBURY ST., CHICAGO, ILL.**

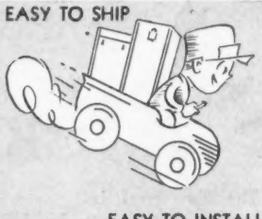


PACIFIC

A-80



EASY TO SHIP



EASY TO INSTALL

CERTAIN TO SATISFY

Heating and Ventilating Unit... superior construction features, amazing operating economies, longer life... every advantage and convenience that spells quality in a gas furnace. Write for complete literature... or mail the coupon NOW.

Pin to your letterhead . . Mail today.
Pacific Gas Radiator Co. (Dept. A.A.-8)
1740 W. Washington Blvd., Los Angeles
Send complete literature and prices —
Name .....
Company .....
Address .....

26 SUCCESSFUL YEARS

. . . and still growing!

FLOOR FURNACES • FORCED AIR UNITS

Pacific

BASEMENT FURNACES • UNIT HEATERS


A. Advantages—

1. The system is characterized by simplicity, both in installation and in operation. The controls required are also simple in type and operation.
2. The number of moving parts is few and practically no servicing is required.
3. The operating costs are reasonably low.
4. The plant is extremely quiet in operation.
5. The water used for cooling may be utilized by sprinkling the lawn.
6. No additional heat from the operation of the cooling unit is added to the heat load of the house.

B. Disadvantages—

1. The method is confined to those localities in which an abundant supply of water at temperatures of less than 60 deg. F. is available.
2. Even in localities having a cold water supply, limitations may be imposed on the quantity of cooling water allowable for air conditioning. Furthermore, local sewerage facilities may impose additional limitations on the amount of water that may be used for this purpose.
3. High mean coil temperatures are accompanied by high indoor relative humidities. However, the relative humidities accompanying mean coil temperatures of approximately 56 deg. F. are acceptable.
4. A relatively large amount of coil surface is required. In order to minimize the amount of cooling coil surface corresponding greater amounts of cooling water must be used.
5. On account of the resistance imposed by the cooling coil to the flow of air, a fan must be selected which is capable of delivering air against a comparatively high resistance. The use of larger face areas of the cooling coil and the use of a lesser number of sections will reduce this air resistance.
6. If the cooling water is supplied from city water mains, the large quantity of water used may materially reduce the water pressure in the service lines to the building. In some cases this may necessitate the use of a larger service line."

## Obituary

Paul Werner, 28, associated with his father, Joseph Werner in the Joseph Werner Sheet Metal Works, 341 Poplar, Memphis, Tennessee, died on April 8. A life long resident of Memphis he succumbed to a throat infection which developed from a tooth extraction a week prior. His wife, two sons, his parents, two brothers and five sisters survive

◆

### Theodore W. Wagner

Theodore W. Wagner, 60, of 1221 S. Sixth, Louisville, Ky., president of J. F. Wagner's Sons Co., sheet metal contractors, died at St. Joseph's Infirmary, July 23. Native of Louisville he was in the sheet metal business here 45 years. His wife, sons Clarence and Theodore, Jr.; a daughter, two brothers, a sister and six grandchildren survive.

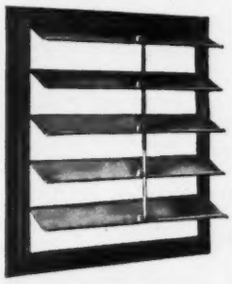
◆

### Reginald Roden

Reginald Roden, of the sheet metal firm of Schumann & Roden, Milwaukee, Wis., died on July 9 from injuries sustained in an automobile accident near Menomonee Falls. He was 61 years of age.

*On Duty Every Day*
IN **NEW YORK WORLD'S FAIR BUILDINGS**

**300 Elgo Automatic Shutters**



The specification of Elgo Automatic Shutters by leading consulting engineers and contractors to meet the ventilation needs of the buildings at the New York World's Fair was not just a happenstance. They selected Elgo Shutters because of their recognized superiority. Why not do likewise? Elgo Shutters are distributed by leading fan manufacturers. See your nearest distributor or write us.

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**Elgo Shutter & Manufacturing Co.**
634 W. Warren Ave.
Detroit, Michigan

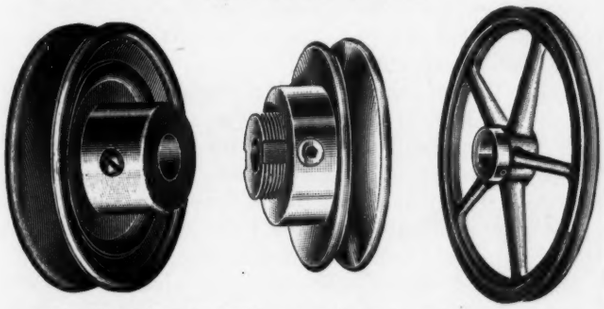
*for* **MOUNTING, SETTING** *and* **REPAIRING**
**WARM AIR FURNACES, STOVES HEATERS, RANGES** *Insist on*
**LACLEDE FURNACE CEMENT**
THE CEMENT THAT DRIES FASTER
SETS STRONGER
LASTS LONGER
BE SURE OF A TIGHTER JOINT AND ONE THAT STAYS TIGHT
*Write* FOR LITERATURE AND FREE SAMPLE

*A Chip* **OFF THE OLD BLOCK**
**Our new hand moldable plastic furnace lining for furnaces, stokers, oil burners, saves time, money, fuel. *Ask us for detailed information & samples.***

**LACLEDE-CHRISTY CLAY PRODUCTS CO.**
411 N. SEVENTH ST. • ST. LOUIS, MO.
*Established* 1844

**Bring Your F. H. P. Transmission Problems to**
**M A U R E Y**

MAUREY Pulleys are designed and made by engineers who are thoroughly familiar with the many applications for V-Pulleys. They have an enviable reputation for sturdy dependability under the severest tests and daily use.



MAUREY STEEL PULLEYS are not the light stamped type with die cast hubs that cause constant replacement of belts. They are made of heavy steel sections with heavy rolled edges and hubs machined from bar steel or malleable iron. That is the reason MAUREY Steel Pulleys give long, trouble-free service in installations of Stokers, Fans, Blowers, Air Conditioning and Refrigeration units.

VARIABLE PITCH PULLEYS of solid steel construction. Speed adjustment of as much as 30%. Fine, accurate milled threads, 20 to the inch assure close adjustment. For Air Conditioning Units. Made in 4 sizes—3¼" to 4½" O. D.

MAUREY CAST IRON PULLEYS are made on a new principle of design that permits a freer flow of air through spokes. They are much sturdier than cast iron pulleys of the usual design.

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*Can YOU*

make *MORE* money in the heating business ?

Yes!!! if you get G-E's BIG NEWS!

All about *new lines... new low prices... new profits!*

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*Fill out and mail coupon today!* And don't make a move until you hear all about it . . . the biggest dealer profit setup in the industry today!

General Electric Company, Div. 190-253, Bloomfield, New Jersey

Send me the *G-E news.*

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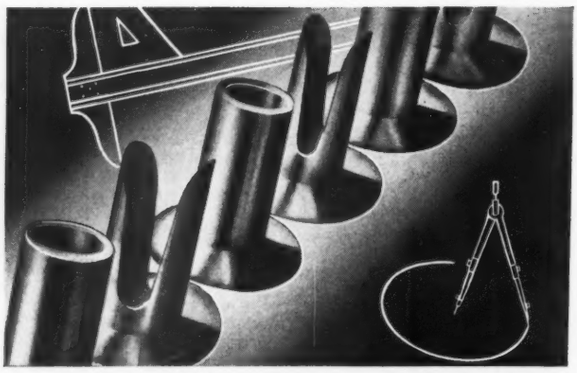
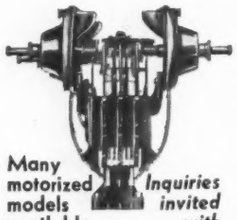


**BE SURE TO SPECIFY**

*The Best Rivets You Can Buy*



Many motorized models available in single stroke and multiple drive

*Inquiries invited with samples of work you wish to do*

The word BEST is applied to T R & S rivets and automatic setting machines as recognition of adherence to the manufacture of a quality product as close to perfection as skill, inspection and processes of manufacture can produce—100% usable, accurately gauged rivets made by the world's oldest and largest Tubular and Split Rivet factory.

**TUBULAR RIVET & STUD CO.**

*World's Foremost Producers of Rivets*

WOLLASTON MASSACHUSETTS

THERE YOU ARE, LADY!
My . . . you're a smart man!
This won't be a "Cold Room" anymore!
VICTOR HEAT BOOSTERS
FLOOR MODEL $7.50
WALL MODEL $10.00
In just 3 minutes you can cure a "cold room" forever. A powerful Victor Heat Booster pulls out the cold air "cork" and brings the heat up fast. Installed at the register and connected to nearest electric outlet it is the easiest, quickest and most satisfying way to meet "cold room" complaints. Ask your Jobber or write for attractive dealer discounts and special profit boosting sales plan. Write today!
VICTOR ELECTRIC PRODUCTS, Inc.
3038 Robertson Ave., Cincinnati, O.

## Sheet Metal Welding

(*Continued from page* 73)

strength. Irregularities or crevices in the underside of the welds of containers to be used for holding dyes, acids, or other corrosive or chemically active materials may be the center of localized chemical action, which condition would be detrimental to the metal container and to its contents. Where the inside of a vessel is to be enameled and is pickled prior to enameling, it is desirable that no crevices exist, since acid may be confined within, and, in time, may cause blistering of the enamel. Crevices will readily collect dirt and bacteria and, in consequence, are objectionable wherever sanitation is a requirement. In this connection, to prevent dirt collection and to facilitate cleaning, the present trend in sheet metal design is from square to round corners. In those cases where minute irregularities in the underside of the weld are not permitted, it would be better to weld from the inside rather than from the outside of the container.

◆

## Register Locations In Cooling

(*Continued from page* 55)

registers due consideration should be given to the proper relations* existing between the air velocity, the aspect ratio, the air temperature, and the size of the room.

### Conclusions

The following conclusions concerning the studies on registers may be drawn as applying to the Research Residence and the conditions under which the tests were conducted.

(1) The absence of objectionable drafts in the living zone was found to be a more satisfactory criterion for evaluating the performance of different types of registers used in connection with summer cooling work than was the existence of small temperature gradients from the floor to the ceiling.

(2) Considering the three types of register arrangements tested, the most satisfactory results were obtained with the high sidewall register and also with the baseboard register which projected the air upwards at an angle of 60 degrees with the horizontal.

*"Characteristics of Registers and Grilles," by J. H. Van Alsburg, Journal section, *Heating, Piping and Air Conditioning*, Vol. 7, No. 6, June, 1935, pp. 304-307.

◆

Don M. Moore, general manager of the Modern Heating and Roofing Co., 2605 East Main St., Chattanooga. Tennessee, announced in March the appointment of Parke S. Poindexter to the advisory and sales staff of the firm. Mr. Poindexter for many years has been identified with the heating and roofing business in Chattanooga. He served with the old Chattanooga Roofing and Foundry Co. and later was associated with the Tom Snow Heating and Roofing Co.

# RELIANCE TIME SWITCHES

FOR

# ATTIC FAN INSTALLATIONS

ARE

## *Fully Automatic !*

You can step out in front of your competition and make yourself handsome profits by selling attic fan installations that are *fully automatic.* Reliance Time Switches are completely automatic in operation, turning the current both ON and OFF at the desired hours, and should not be confused with switches that must be started by hand.

*Fully automatic* attic fan installations are easy for you to sell and because they eliminate needless hours of operation, they are economical and more efficient for your customers to own.

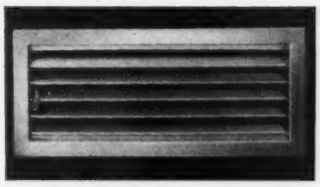
Write today for further information.

**RELIANCE AUTOMATIC LIGHTING CO.**
1929 MEAD STREET — RACINE, WISCONSIN

# WATERLOO REGISTERS

## UP go sales—

## and Profits!



Boost your sales—share in the profits—as more and more leading architects and interior decorators specify Waterloo Registers. . . . Waterloo gives you EVERY selling advantage:—Modern Beauty, plus mechanical features that assure proper control of air flow.

WRITE TODAY—for your Free copy of the new illustrated catalog giving charts, installation data, prices.

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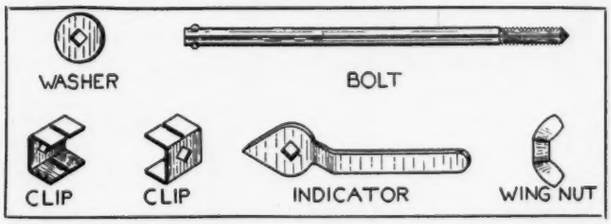
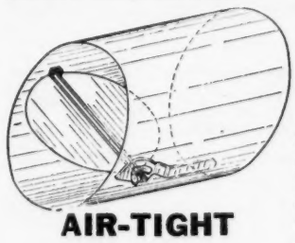
**Waterloo Register Company**
WATERLOO, IOWA — SEATTLE, WASH.

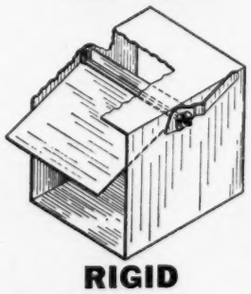
# MINUTE DAMPER CONTROL

*eliminates chatter and buckling*



AIR-TIGHT



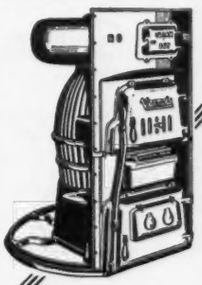
RIGID

## *It's* NEW! *Saves* TIME!

Figure your savings in *time, money* and *work* — by using the new MINUTE Damper Regulator! Designed by an entirely new principle, the Minute unit can be installed in one minute's time on most jobs. No rivets, tiny nuts, bolts or sheet metal screws to bother with. Assures rigidity without sag or buckling of damper. Absolutely chatter-proof and air-tight. Get up-to-the-Minute advantages at a *new low cost.* Write for FREE sample and prices.

**Distributors:** *Send for details about attractive Minute Proposition.*

**JOAL MANUFACTURING CORP.**
2058 CANTON ST., TOLEDO, OHIO



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# AFTER PROFITABLE GRAVITY JOBS

Gravity installations are still the best part of the warm air heating business and it will pay you well to go after the jobs with a heavy, dependable furnace.

Operating efficiency and economy are built right into Mt. Vernon Vernois Furnaces. Constructed of "Vernalloy" the metal famous for its "Hell on Earth" tests, they will enable you to meet competition and beat it without any sacrifice in quality.

It only requires a post card request to get full information. Drop us a line today!

**Vernois FURNACES**

**MT. VERNON FURNACE & MFG. CO.**
Mt. Vernon — Illinois

# AJAX

A NEW LINE OF
**PREFABRICATED DUCTS and FITTINGS**
*for* **Forced Air and Air Conditioning Installations**

Our Catalog "A" (Gravity Fittings), Catalog "B" (Forced Air Fittings) are yours on request.

**THE CINCINNATI SHEET METAL & ROOFING CO.**
*Furnace Fitting Department*
230 E. Front St. Cincinnati, Ohio

# Is This You Or Some Competitor ?

● Is HE the first man in the basement, and there selling things to your customer? How about beating him to it?
They are all doing it, more and more. Sellers of new plants, fuels, services, making their sales approaches by first cleaning heating plants.
Cleanings alone do pay you well, when done with your Super. And bigger jobs always follow cleanings. That chimney, too—so easily cleaned from the basement, with the special Super tools—cost you nothing extra. But you do CHARGE extra money for each chimney. Say, when was your own chimney cleaned?
It's a push over for you, and a profit maker too. A postal brings your Super Plan Book. Learn how they MERCHANDISE a business. Then try your Super free. Prove how quickly and easily it turns soot into money for you.

**--------USE THIS COUPON--------**

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1944 N. 13th Street, Toledo, Ohio

Send me the Plan Book and complete information about your free trial and the new low-priced Super.

Name .....

Street Address .....

City and State .....


## Sales Increases When Price Is Cut

(*Continued from page 39*)

per length. Assume your cost is 75c per length so your margin of profit is 25 per cent. To stimulate business you announce a 10 per cent reduction in price. Find 25 per cent margin across the bottom of the chart. Follow this line up until you strike the curve marked 10 per cent reduction. Move to the left and find 66 per cent increase.

This means that to obtain a gross profit in dollars equal to your original profit you will have to sell 66 per cent more lengths of smoke pipe.

Note on the chart that as gross margins decrease (gross margins below 25 per cent, for instance) the increase in required sales mounts steeply. In other words, the larger your margin the less you must increase sales.

The chart is based upon a formula which can be used for odd margin percentages. The formula is:

Increased $ Sales Volume Percentages

$$= \frac{G}{G-X} - 1$$

where G = original gross margin (per cent of sales)
X = price reduction in per cent.

Example: Profit margin is 32 per cent; proposed price reduction is 7½ per cent. What is the sales increase in dollars required to obtain the same gross profit in dollars?

Solution:

$$\frac{32}{32-7.5} - 1 = 30.6\%$$ added sales volume required.

## Move First Metal Office Building

(*Continued from page 77*)

ready for occupancy is unpredictable at this time—hardly within the next four years. By the time the municipal office building materializes, the need for an administration building at the new City Marine Terminal now under construction is anticipated, or for a similar building at the Municipal Airport. The Department of Public Works already has plans completed for the rearrangement of this aluminum structure to serve as an administration building at its airport.

Whether the Governor Street lot will then be sold or be used for other City purposes is not known at this time, but disregarding the lot, which, in the event it is sold, is likely to bring a price equal to that paid for it, and including interest on the purchase price of the lot at prevailing rate and amortization of moving cost, the building will cost the City approximately $1.12 per sq. ft. per year for the next four years. This figure, of course, includes watchman and janitor service, gas, water, and electric service, and repairs, based on past experience, and takes into account the 3,000 sq. ft. additional floor space gained from the old stucco residence on the Governor Street site.

# JANUARY 1940 . . .

will be a *BIG* month for the Industry

American Artisan's Annual Directory and Show Number will be issued about January 15th

AMERICAN ARTISAN
6 North Michigan, Chicago, Ill.

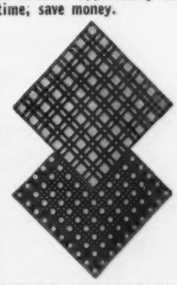


## REGISTERS and GRILLES

*No. 3320 REGISTER WITH INDIVIDUAL ADJUSTMENT OF GRILLE BARS—45° TO THE LEFT OR RIGHT.*

Standard Stamping presents to the heating and air conditioning trade a striking new line of registers and grilles for gravity warm-air heating, air conditioning and ventilating systems. Modern in appearance and far better than average in performance, they offer the contractor an unusual opportunity to add the final touch to a good job, and at the same time, save money.

A complete catalog containing time saving charts and tables as well as the full line of "Standard Air-Control" registers and grilles is now available and will be sent on request. Write for your copy today!



**PERFORATED METALS**

Screens and grilles for many industrial purposes such as sorting, sifting, and light fancy panels. We have a complete line for almost any use.

**WRITE for CATALOG!**

**STANDARD STAMPING & PERFORATING COMPANY**
3131 W. 49th Place — Chicago, Illinois

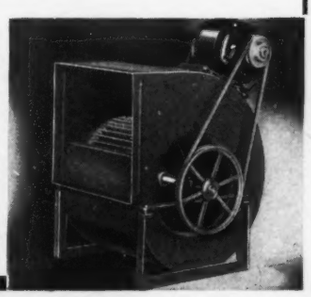
9 Models
*UTILITY*
*Air KOOLERS*

Complete evaporative coolers with Utility Blowers, "No-Sag" pads, self-contained water recirculator.

**UTILITY**

*BLOWERS*

Dynamically balanced, self-aligning bearings, die-formed, baked enamel finish, single or double inlet.



**UTILITY FAN CORP**
2528 Santa Fe Ave., Los Angeles, Calif.
122 E. 42nd St., New York, N. Y.



# SO...

You'd like to sell more ductwork and do more business all through the year

?

*You can* — if you send for G-E's BIG NEWS!

All about *new lines . . . new low prices . . . new profits!*

Here's the money coupon! *Fill it out and mail it today!* It may change your entire future!

General Electric Company, Div. 190-353, Bloomfield, New Jersey

Send me the *G-E news.*

Name_____

Street_____

City_____ State_____

## You Need Not Go Broke

(*Continued from page* 44)

down into that for saleable goods, and that for the shop, as tools, supplies, etc., listed as sundries. The two together must equal total purchases. Shop supplies is further broken down into shop expense, gas, oil, insurance, advertising, etc. Here are the headings:

| Date | Name of firm selling article. | Total amount this invoice | Merchandise (if for resale). | Sundries (if for cost of doing business) |
|---|---|---|---|---|

6. **Check and Deposit Record**—"I don't know how important it is for the average shop to keep a check and balance register, considering that one has the same figures in his check book; but it is important if you want a daily check on your balance, that can be picked up quickly and studied," Mr. Dees reported. This is a regular journal entry book giving deposits and withdrawals.

7. **Journal of Depreciation**—This settles all doubts in matters involving taxes. It need be taken down only once a year. It shows deterioration allowance on rolling stock and shop equipment. It has been especially handy for systematizing truck investment; each car is listed separately. Assume, for instance, a truck is listed at $400 one year, $300 the next, and so on, with $100 off each year, by the time the truck is ready to go, it is no longer on the books. In its place on the books will be a new truck, replacing it. Column headings in this book are:

| Equipment (auto) | When bought | Its value | Yearly depreciation. |
|---|---|---|---|

8. **Balance Sheet**—Shows assets and liabilities; breakdown of operations expense sheet, etc. The Kansas Sheet Metal Co., uses two balance sheet statements; one before closing the year, the other just after closing on December 31. The second sheet takes care of adjustments and corrections.

•

## Technical Code Heating and Cooling Job

(*Continued from page* 53)

It will be seen, therefore, that this house is zoned horizontally instead of the vertical zoning commonly employed. With this arrangement it is possible to cool the basement, or the first floor, or the second floor individually according to occupancy, or to throw the entire cooling capacity into the full house when weather conditions are mild and no special occupancy present.

THARCO
FOR OVER 25 YEARS
THE STANDARD OF QUALITY IN FURNACE CEMENTS
THARCO ASBESTOS FURNACE CEMENT
MANUFACTURED ONLY BY THE ARMSTRONG COMPANY DETROIT DALLAS CHICAGO
THARCO ASBESTINE STOVE-BOILER PUTTY

PORTABLE SHEARS
ALL-ALLOY

ALL-ALLOY No. 2 cuts up to ¼" steel plate.
ALL-ALLOY No. 1 cuts up to No. 11 gauge strip or sheet.
Special blades may be had for shearing stainless steel.
FULLY GUARANTEED
BREMIL MFG. CO. Erie, Pa.

MORE VALUE IN A DOYLE VACUUM CLEANER
Those who know, prefer to buy even a *used* DOYLE rather than buy a vacuum cleaner of some cheaper make.
Actually larger motor, wound for lower speeds to insure long life—larger fan, mounted directly on motor shaft—2-inch plus dia. hose with double the area of an 1½ hose, handling 210 cu. ft. of air per minute at a speed of more than 180 miles per hour.

These are only a few of the reasons why a DOYLE is a quality machine throughout that does more work, stays on the job longer and costs less to operate. WRITE FOR THE DOYLE PLAN WHICH SHOWS HOW TO GET MORE BUSINESS, EVEN FROM A COLD START.
DOYLE VACUUM CLEANER CO.
227 STEVENS ST., S. W. GRAND RAPIDS, MICH.

## ACME "Hot Spot" WELDERS

Universally accepted as the sturdiest, easiest handled, most economical electric Spot Welder on the market.

*Write for literature and prices*

**Don't Rivet**
**SPOTWELD!**
**with an ACME**
Lifetime Guarantee!

*Complete range of sizes*

**ACME ELECTRIC WELDER CO.**
Distributors in principal cities
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## CHECK YOUR AIR-CONDITIONING INSTALLATIONS WITH THE "ALNOR" VELOMETER

This all-purpose air velocity meter indicates air velocities directly and instantaneously on the scale in f.p.m. without the necessity of timing or mathematical calculations. Standard range 0-300, 0-3000 f.p.m. Other ranges available up to 18,000 f.p.m.

Write us today for a folder giving more complete information.

**ILLINOIS TESTING LABORATORIES, INC.**
412 N. LaSalle Street Chicago, Illinois

## Have You the New 1939 Ward Catalog?

Devoted entirely to machines, tools and supplies for fabricating sheet metals exclusively. If not write us today.

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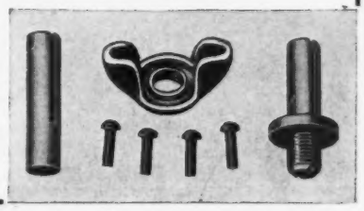
564 W. Washington Blvd., Chicago, Illinois

## THE "GOESE" ORIGINAL TIME SAVER DAMPER CONTROL

Patented

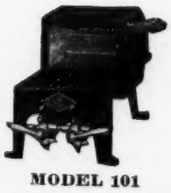
MORE POPULAR THAN EVER
COAST TO COAST DISTRIBUTION

Ask Your Jobber



**GOESE MFG. CO.**
2548 N. 18th Street
Milwaukee, Wisconsin

## Inexpensive Operation; Low Cost and High Efficiency! That's a Johnson Bench Furnace



MODEL 101

Two Johnson direct jet Bunsen burners with shut-off valves and pilot develop intense heat without expensive blowers or forced-air draft. The No. 101 is a versatile, sturdily-built furnace that develops maximum heat with its refractory lined fire-box. Ideal for heat treating carbon steel tools and parts. Handles soldering coppers up to 12 lbs. per pair. Adapted for use with natural, manufactured, or bottled gas. Take advantage of the exclusive features and low price of famous Johnson Bench Furnaces. Write for your FREE catalogue now!

**JOHNSON GAS APPLIANCE CO.**
Cedar Rapids IOWA

## Repair Parts GUARANTEED TO FIT

BRAUER
REPAIR PARTS
STOVE FURNACE BOILER OIL STOVE RANGE

SAVE BY ORDERING ALL FROM

**A. G. BRAUER SUPPLY CO.**
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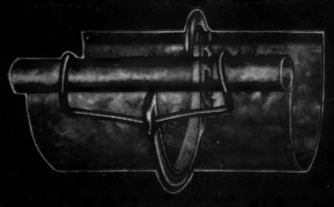

Saves time and labor

"BB" SPRING CIRCLE CLIP

Furnished only with "B B" Circles at no extra charge over old style straps.

**BERGER BROTHERS CO.**
229-237 Arch Street, Philadelphia, Pa.

## GRILLE Head-Quarters

Our REGISTERS AND GRILLES are installed in more than 50 Buildings and Exhibits at the New York World's Fair. Look for them when you visit the Fair.

**REGISTER & GRILLE MFG. CO., INC.**
70 BERRY ST. BROOKLYN, N. Y.

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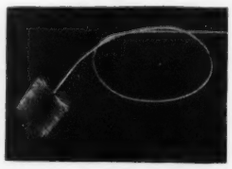

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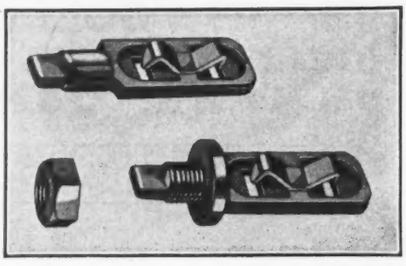

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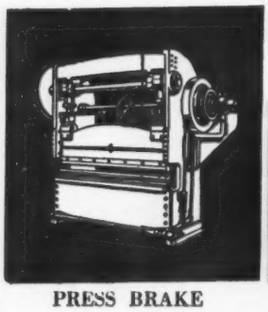

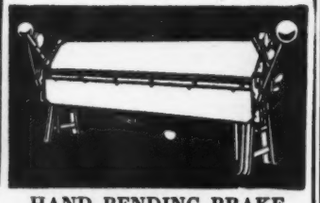

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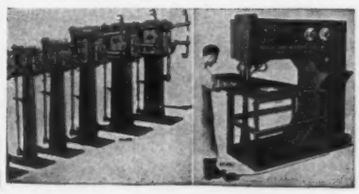

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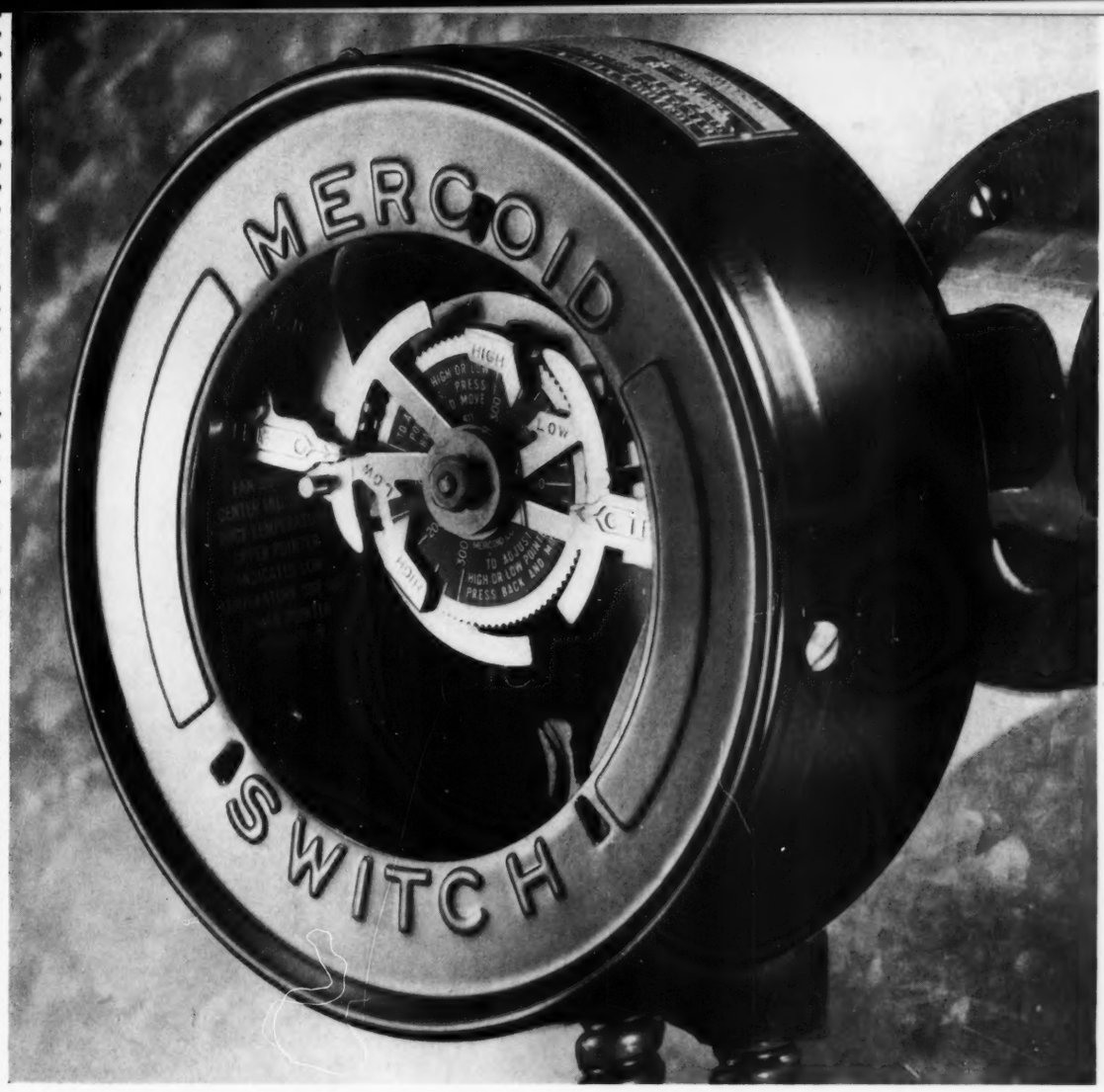


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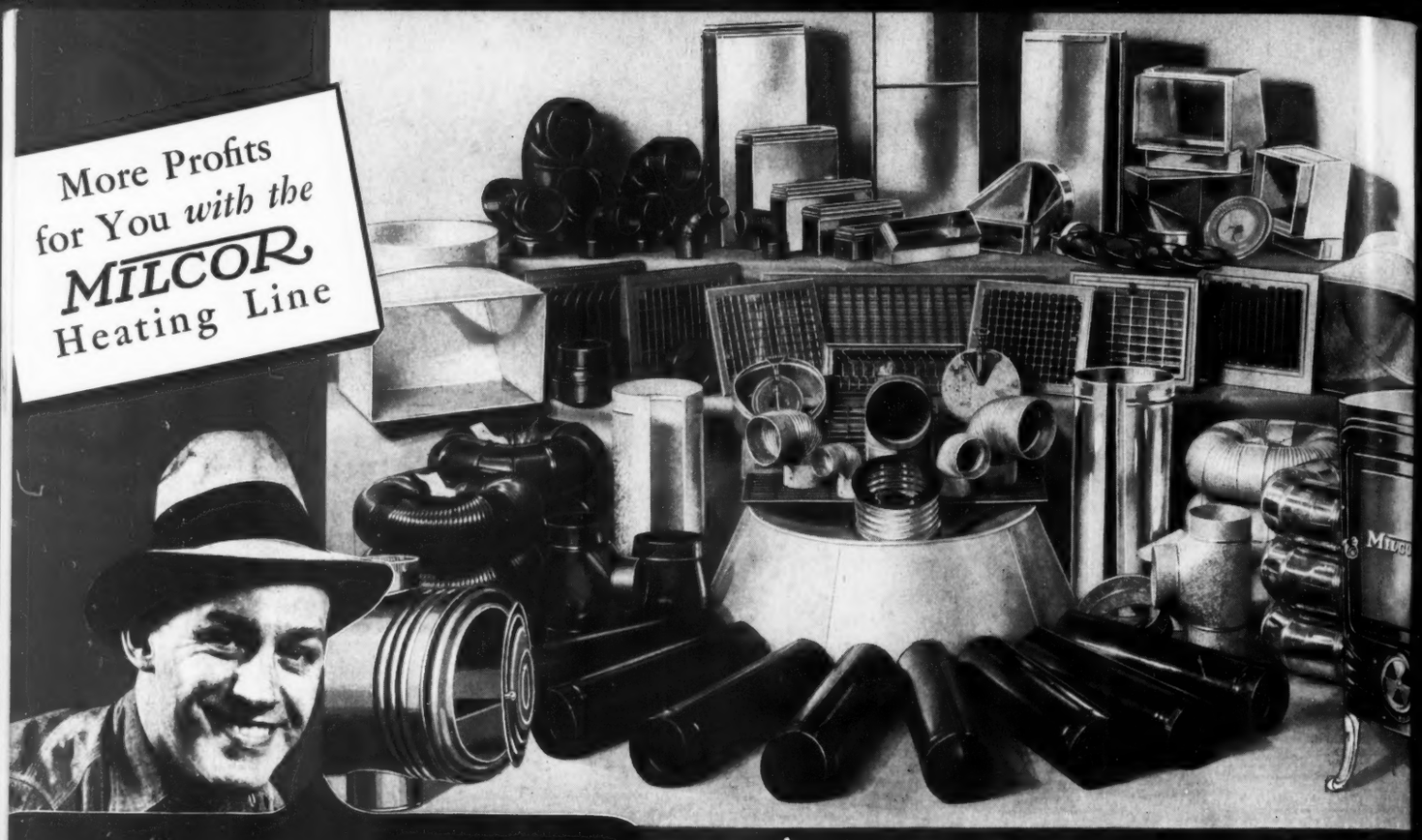
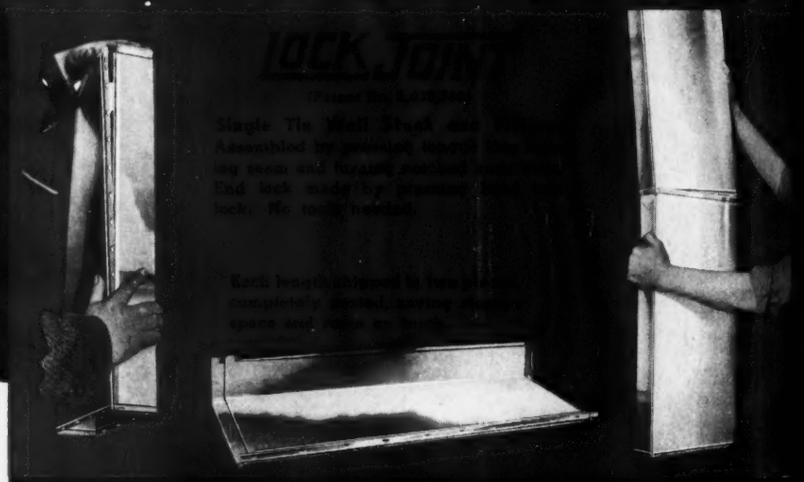



## You can bank on MILCOR for everything you need in Furnace Pipe and Fittings to make money



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**Adjustable Sections**
Can be adjusted to any length, 6" to 12".

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